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# Mainframe users demand DEC meets conditions

by John Kavanagh

DIGITAL Equipment mainframe users last week laid down their conditions for staying with the company after its axing of an upgrade processor for the 36-bit DECsystem-10 and 20 range.

High on the list was a demand for changes to the VMS operating system on DEC's Vax 32-bit minicomputers to accommodate the big time-sharing networks typical of DECsystem-10 and 20 installations. Users also called for tools for converting applications software to run under VMS, plus more enhancements for existing DECsystem equipment.

DEC has proposed that users of the 10-year-old DECsystem range should upgrade by moving to the Vax or by linking in extra DECsystem processors. It has promised them at least five years' support and development of existing products.

Users met in Zurich last week to discuss these proposals. "There was a lot of discussion on the facilities needed in VMS if DEC is to persuade users to move across," said Ian Service of York University, chairman of the DECsystem user group in Europe.

"There is the problem of running big, time-sharing services under VMS with a dynamically changing mixture of users. The DECsystem TOPS started as a big, time-sharing mainframe operating system, whereas VMS has grown up from smaller machines," he added.

He also said there had been "strong calls" for conversion aids from TOPS to VMS.

DEC was making some processor enhancements because of users' requests — but there were calls for more "stretching methods", he said.

User reaction to the axing of the troubled upgrade processor project remains mixed. Service said his own site had wanted to go to the upgrade processor, but was now considering other possibilities. "The resident supplier always has the edge — but all bidders will be equal this time round," he said.

Donald Hobson, data processing manager at bureau Datacall, said DEC's plans were not acceptable. "We have no problems at all with our DECsystem-10s," he said. "We get a marvellous response time.

"We're not all all happy that the 36-bit machines are going. We have 5,000 programs — they would all have to be rewritten to run under VMS."

But Steve Penrose, engineering services director at ADP, one of the biggest DECsystem users, disagreed. "We're very encouraged that resources are being freed from the upgrade development project and made available for more important things like linking large numbers of systems and improving disc storage," he said.

MESSENGER . . . "I've put in a lot of time and effort, so it's a bit of a blow"

# Pansophic ends legal battle with Future for SGT control

by George Black

PANSOPHIC has ended its legal battle with Future Software for control of the hot software property, SGT, by buying its marketing rights.

The announcement implies a retrospective admission by the big IBM systems software house that Future owned the distribution rights — even though Pansophic had bought the code itself.

Future had claimed that it had obtained the rights from Software Generation Technology. It was suing both SGT and Pansophic for $115 million, claiming that their joint deal was invalid.

Now Pansophic will be able to sell the highly-reputed CICS applications development aid worldwide from next week and the price is likely to go up sharply. Official launch could be November.

Pansophic, which calls the program GENER-OL, has been giving it a low profile so far in the US, while it finalises the documentation and gets its technical support team in place. The recent raising of $16 million through a share issue should help this drive.

Part of the truce terms between the rivals is that Future can name nine clients as its own, out of 80 that have attended its UK seminars, provided they sign up by next Tuesday.

Another part of the deal [illegible] passed on to Future [illegible] Wall, according to [illegible] non-disclosure of the [illegible] Future received for the [illegible].

Pansophic [illegible] [illegible] would get it at a [illegible].

Future's UK manager, [illegible] Messenger, expressed [illegible] ment at the loss of SGT.

"I've put in a lot of time and effort, so it's a bit of a blow," he said. But he added that it would be "a lot cleaner" for one company to handle it rather than two.

# Ferranti breaks into capital voice

by Kevin Cahill

FERRANTI is pushing further into information technology by introducing two major new products at the Telecomms Show in Brighton next week.

The first is a digital voice management system, which marks Ferranti's bid to break into the capital goods end of the new markets in digitalised voice-related products.

The second product is a complete teletex and telex management system.

The voice management system, based on Ferranti's Argus range of computers, comes as a complete unit and will cost between £35,000 and £80,000 depending on the facilities chosen.

According to Ferranti the FVM, as it is called, will be sold mainly through distributors and the major advantage over rival systems, such as IBM's, is that it does not have to be attached to any particular type of PABX.

Installed alongside any existing digital PABX, the system can serve any number of users and is limited only by the amount of disc storage chosen.

The entire system is based on the conversion of voice input into digital signals stored on Winchester discs.

Because the system is digitalised and not dependent on magnetic tapes, messages can be selectively tagged and controlled.

A caller using the system from any push-button phone, and without any training, can expect to have competent use of the system within a few minutes.

The Ferranti VM, using voice, guides users through the system, which can include simple recording of messages from one caller to another, or from one caller to many recipients. The system will go on calling even if destination phones are engaged.

One of the reasons companies like Ferranti and IBM have decided to build machines such as the FVM is market research which has shown that a major loss in office productivity occurs when roughly 50% of all calls, particularly internal calls, are lost because the recipient is either engaged or not available.

In addition, where messages can be stored to await a caller's return there is a major productivity gain if the call is kept to the message, rather than converted into a conversation.

The Ferranti VM dates and times all calls, runs a recorded delivery system, and can be set to call a number at a pre-arranged time.

In general the system needs no supervision but there is a control console which Ferranti claims can be operated by any switchboard operator.

The second major communications product Ferranti will introduce at Brighton is the combined telex and teletex management system.

Teletex has still not taken off in the UK, but with BT subsidising the initial users by 50% of costs, the service is expected to be in much wider use by next year.

In anticipation of this Ferranti has enhanced its medium range telex management system which can handle a maximum of 12 lines with teletex facilities.

The main difference between telex and teletex is that teletex, based on an eight-bit code is much more flexible and faster than telex, which is based on a five-bit code.

Currently the teletex system uses buffered access to the telex lines, reducing the advantages of the system, and conversion to faster teletex network is several years in the future.

Ferranti has a major entrant for the digital switch market, the F2000, now on trial, and it is seeking BT approval.

# Directors charged with fraud

by Philip Hunter

TWO directors of a computer shop in Hatfield were last week charged with fraud — three days after reporting the theft of £30,000 worth of computer equipment.

Paul Lennard, 33, and Nigel Lochyer, 38, directors of the Microworld shop which trades under the name Gem Systems, were charged last Friday with conspiring to defraud their insurance company, the Eagle Star. According to Chief Inspector Smith, of Welwyn Garden City CID, a burglary was faked in order to pick up the insurance money.

Late last month two directors of another computer supplier in the area were charged with a similar offence. David Webster, managing director of Amida Computer Supplies in Welwyn Garden City, near Hatfield, and one of the other directors were charged with faking the burglary of their factory in May. They will appear in magistrates court on October 15.

The arrest of Lennard and Lochyer for the later alleged offence came as a result of CID investigations. They appeared [illegible] Monday, and [illegible] until October [illegible].

# Trilogy goes public a year early

by Kevin Cahill

TRILOGY Corporation, Gene Amdahl's new mainframe computer company, is to go public a year earlier than expected, amidst growing optimism that its new machine's performance will be better than originally forecast.

The first public offering of shares will be made by American finance house Merrill Lynch on the Over the Counter market in New York in October and is expected to raise close to $100 million.

Trilogy is offering six million shares at a price of between $12 and $15.

The final price will be set closer to the actual offering date and is likely to be nearer to $15 than $12.

American financial institutions have begun to take a new interest in Trilogy, following massive investments in the company by DEC and Sperry earlier this year.

The investment by the two companies was based almost entirely on the spectacular potential of Trilogy's new wafer level chip, which has succeeded in incorporating close to two million discrete components on each chip.

In Trilogy's original business plan there was no provision for any significant revenue from the semiconductor technology but the Sperry and DEC investment was partly advance payment for the right to license the [illegible].

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# Thatcher calls halt to BTG monopoly

by George Black

THE government will end the British Technology Group's monopoly of the exploitation of public research and will let venture capitalists trawl for ideas in the Defence Ministry.

The two announcements: aimed at bringing innovators and financiers closer together, were made at a seminar on science, technology and industry at Lancaster House in London on Monday.

Mrs Thatcher, who chaired the gathering, said the BTG's control over the application of government-funded research had been very restrictive and widely criticised, not least by scientists wanting to exploit their own work and choose their own industrial partners.

Information technology minister Kenneth Baker added that the BTG's function as a "hospital for sick companies" was being run down because it was not right that "all the eggs should go in one basket".

Defence secretary Michael Heseltine said groups of entrepreneurs were being invited to seek out marketable inventions within the Ministry's research establishments.

"A pilot scheme at the Royal Signals and Radar Establishment will involve Cogent, Prutec, Hereford Venturers, the Cranfield Business Institute, Lazard's and Barclays Bank clubbing together to sponsor a portfolio with commercial potential.

Heseltine said RSRE's suitability for the scheme lay in its electronics-based technologies.

The experiment will be repeated at air force and navy establishments.

In a speech from the floor British Aerospace chairman Sir Austin Pearce lashed the House of Commons Public Accounts Committee and the Treasury for criticisms made earlier this year of high profits made by defence contractors.

He welcomed Heseltine's review of procurement policy and the switch from cost-plus to fixed-price contracts, but commented bitterly: "The administration is very good at ensuring that the lights stay at red."

Forceful contributions to the debate were made by two computer firm chiefs, Sir Clive Sinclair and Acorn's Hermon Hauser. They both urged the introduction of tax changes on staff share options. Hauser said they had lost the chance to recruit a top Intel man because they could not offer him an option equal to what he could get for himself in the US.

Mrs Thatcher said that she had got the point.

Both Sinclair and Lord Caldecote, of Investors in Industry, spoke of the need for pensions to be made portable.

Trade and Industry Secretary Cecil Parkinson responded that the issue was already under discussion in cabinet.

Sinclair said it was not easy to profit from investment unless a company went public. He wanted an end to the "illogical discrimination" against unearned income and staff share options taxed at capital gains rate.

"Wouldn't life be simpler if we just had one flat rate for income no matter how acquired?" he observed.

GEC managing director Lord Weinstock said software concerns and optical fibre makers trying to boost exports were being hampered by inequitable tariffs between the EEC and the US.

Sinclair repeated his warning to Mrs Thatcher on the future of Inmos. Without naming the firm, he said semiconductors were as crucial to this industrial revolution as metal foundries were to the last. "We have just time to right this position but the window is closing fast."

THATCHER . . . "BTG control was restrictive."

## US Osborne runs out of cash

PORTABLE micro pioneer Osborne Computer has stopped building machines. The US manufacturing company has run out of cash, laid off all but 70 staff and is looking for buyers. It is expected to declare bankruptcy this week. But the separate UK subsidiary is healthy, says managing director Mike Healy, who is trying to put together a package to build and develop the micros under licence in the UK for the European market. Machines are still being supplied from the stockpile of unsold units that contributed to the US company's cash problems.

## IBM cuts prices

IBM has cut UK prices on the 3080, 3081 and 3084 mainframes by between 14 and 20%. This extends to upgrade prices and covers all sub-types. The company says that the cuts have been made possible by substantial volume shipments of the 308X range, including 100 machines for the UK.

## Sinclair step

A BIG step towards the ICL-Sinclair Research flat-screen terminal could be taken this week when Sir Clive Sinclair is expected to unveil a flat-screen television. He hopes to be making 10,000 a month at the Timex factory in Dundee by the end of the year. The technology could form the basis of the computer terminal.

## DEC likes Ayr

DIGITAL Equipment's bid to expand into the European market for personal computers will include the manufacture of components at Ayr, Scotland. The transfer of production to Europe started last year with changes at its West German factory.

# Legal jam causes a Unix hold-up

by Claire Gooding

POTENTIAL Unix users are losing time, and the system's owner AT&T is losing money in a massive legal jam. A heavy 20% increase in the number of people applying for a Unix licence has led to a queue which is costing AT&T thousands of dollars in lost licence fees and administrative costs.

The problem lies in AT&T's top-heavy legal procedures which insist that every licence is individually examined and processed. There is no quick and easy way of issuing a source licence for Unix, which means that Western Electric, now permitted to market the system openly, is only held up by its own massively complex administration.

"There's a substantial logjam of paper," explained Jim Kennedy, who is marketing operations district manager for AT&T in charge of proposal development and Unix co-ordination. "It's not the people but the methods that are the problem. There are so many cycles to be gone through by each applications that the licences have to go back and forth several times before we can think about sending out the software."

The crushing weight of administration is eating into profits to the degree that AT&T is even rumoured to be making a loss on Unix sales. The system is getting flak from those within Western Electric who are anxious to get on with the potentially lucrative business of marketing Unix now that the stranglehold of US monopoly laws has been loosened.

The process, which market operations manager for Unix licensing, Bill Murphy, prefers to call "divesture", should be complete by January 1984.

It will split the present conglomerate of AT&T into several smaller companies, allowing the companies to trade in such previously forbidden goods as systems software.

Western Electric itself is now fully geared up to support Unix commercially despite the administrative and marketing problems.

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# BT in bid for lion's share of cable TV

by Philip Hunter

THE list of 37 consortia bidding to run the 12 pilot cable television projects on offer from the government shows that British Telecom intends to take a big slice of the cake.

BT is listed as a major shareholder for ten of the consortia, and its involvement does not end there. It has also bid for licences to lease cable systems to two of the other aspiring operators.

British Telecom is further involved with other major shareholders, such as Selec TV, which is a big sub-contractor to BT.

Another aspect is that BT is involved with competing consortia to operate cable TV in the Preston, Lancashire area, which is rather like placing an each way bet in a three-horse race.

Other well-known names are represented as shareholders of the consortia. Plessey is involved with Beamtrade bidding for the Westminster area. GEC is involved with three of the consortia. Ferranti, STC and Racal are also represented.

All the consortia have submitted bids simultaneously to the Home Office for provision of cable, and to the Department of Industry, for provision of the service.

Each of the 12 successful consortia will provide and operate the cable service in its area.

Announcement of the successful consortia is expected in November after EIU Informatics, selected to evaluate the applications, has made its recommendations. Priority will be given to consortia offering the most advanced services, including the possibility of two-way interactive communication, which is of particular interest to computer users.

Systems offering the possibility of using the next generation of cable technology, the star switch, will also be favoured, and offered an initial licence running for 20 years, as opposed to 12 years for consortia offering just tree and branch networks.

Consortia left out of the pilot scheme will be able to compete in other areas when the government sets up its Cable Authority. The White Paper for this was approved by Parliament at the end of the last session.

The 12 successful consortia will, however, have a head start on others and will be able to try out systems well in advance of satellite television coming in 1985 or 1986. It is only then that cable TV is likely to become profitable.

RUSSELL (Left) and KUROSE . . . "Careful when we establish partnerships."

# Scan Data wins UK rights to Toshiba business micros

by John Riley

SUSSEX-BASED systems house Scan Data International has gained sole UK distribution rights to Toshiba's 8-bit and 16-bit business microcomputers, which had their UK premiere last week. At the same time, Scan announced that it has become sole UK distributor for Peachtree software for the Toshiba, Onyx and Texas PC microcomputers.

"We have been looking for a distributor in the UK for about a year", said Fumio Kurose, Toshiba Europe's president. "It is not enough to manufacture excellent hardware; it is necessary to make it a saleable product with good software for total solutions. We also wanted a local presence offering special support.

"We are, therefore careful when we establish partnerships. Toshiba is a very loyal partner and we look forward to successful co-operation."

Toshiba's UK distributor Office International will continue to distribute other products, but Scan now has sole distributorship of its micro products.

Scan Data, the first computer company to go public on the Unlisted Securities Market in 1980, will sell Toshiba's T100 and T300.

The T100 is a Z80A based briefcase CP/M micro which has 64 Kbytes RAM and eight-colour display. It can be plugged into a TV set. Entry end user price for the machine is £1,495.

The T300 is an Intel 8088 16-bit machine, supporting MS/DOS and CP/M 86 with graphics offering 256 colours, and a 10 Mbytes in-built hard disc. Entry price is £2,495.

Scan Data is to look for "reputable" computer dealers to sell the machines. "We are becoming increasingly aware that you do not necessarily need computer professionals to supply to the business micro market", said Scan's managing director Steve Russell, "so we aim to seek a balance." Russell expects to have 150 dealerships by June next year and hopes to sell 2,500 Toshiba machines in the next year.

Scan Data also sells the Texas Instruments personal computer, and is an OEM for Texas Instruments' minicomputers as well as Onyx microcomputers.

# Newcomer shakes up the DEC distributors

by John Kavanagh

A NEWCOMER to Digital Equipment's authorised computer distributor scheme has attacked systems houses for expecting favours from the minicomputer giant, but doing nothing in return. And the company, Minicomputer Commercial Software, has warned that they must change their attitude to survive as DEC becomes more aggressive in their own end user markets.

"Some of the authorised distributors certainly need to sort themselves out and get into some vertical markets," said Brent Conlon, sales and marketing director at Minicomputer Commercial Software.

"Too many have been DEC systems houses for a long time, and they expect favours. They want the company to give them sales leads, yet they're not adding any value to the equipment themselves.

"They're naturally getting worried about competition from DEC."

Conlon's firm covers defined markets. It has specialised in insurance broking systems for years, but is now moving into freight and plant hire systems.

"DEC has told us we make an authorised distributor," Conlon said. "The message is getting across very strongly that we'll all go into vertical markets."

DEC angered UK systems houses early this year when it told a Computing Services Association meeting they would only be successful by going for vertical markets rather than offering general products such as ledger systems. DEC has ledger packages in its catalogue of available software, now being priced.

But other official DEC systems houses disagreed with Conlon and with DEC.

"He's absolutely wrong," said Stephen Hoare, head of Allied Computer Services. "You don't need to be in vertical markets to add value. We have vertical packages, but we also offer ledger and payroll systems off the shelf, because we're good at tailoring systems.

"If you rely solely on vertical systems you could be in trouble because almost every user needs some horizontal packages such as payroll."

Richard Coulson, director of CHA, agreed. And he welcomed possible competition from DEC with its ledger systems and other horizontal products.

The authorised distributor scheme was introduced at the end of 1981. Minicomputer Commercial Software is only the 10th to be admitted to the group. They call themselves an industry elite because DEC examined them in great detail before appointing them. They get the same discounts as DEC's 300 official original equipment manufacturers but get extra benefits such as backing for product promotions.

# ICL helps the taxmen with their searching

by John Kavanagh

ICL's CAFS content-addressable filestore could be set for take-off at last with plans by the Inland Revenue to install 24 systems across the country as part of the £150 million PAYE automation project.

The Inland Revenue application – identifying taxpayers from variable and doubtful information – has already grabbed the interest of the Department of Health and Social Security national automation project and ICL says many other government and commercial organisations need this facility.

The Inland Revenue is setting up 12 regional computing centres, each with between two and six ICL 2966 mainframes, between now and 1987. The first centre is going live in the West Midlands in January.

If this first CAFS project is successful, two systems will be installed at each centre, one for back-up. The 2966s will be linked to the CAFS using ICL's IPA network architecture.

And eventually a national searching facility will be set up, with all the regional 2966s linking to a central CAFS system as well as to their local system.

The entire CAFS contract is around £2.5 million – a small amount compared with the £60 million the Inland Revenue is spending on 47 2966s and 18,000 DRS terminal systems. But ICL sees this as a "very prestigious reference site" for this application.

CAFS is a very intelligent disc system which can find information using only partly-complete search keys.

"In our manual system if we don't have a reference number we have to look up names and addresses in a card index or write to a taxpayer for more information," said Inland Revenue project manager Steve Matheson.

"We want to eliminate this paper chase but we can only do it if we can identify taxpayers solely from variable amounts of name and address information."

Matheson said CAFS was not available under the 2900 VME operating system when the 2966s were ordered in 1980. At that time the Inland Revenue thought it would have to put the manual system on the computers.

"It wasn't clear how we would meet the need for national tracing," he said. "But when CAFS came along most people were very impressed by it."

■ Just before the Inland Revenue news, ICL announced its latest CAFS order for commercial applications. The National Girobank gave the company a £3 million contract for a CAFS system, a dual 2988 mainframe, an ME29 and a System 25.

# Sinclair signs an assembly deal with the Chinese

by Philip Hunter

SINCLAIR Research, which sells home computers in the US and Japan, is on the doorstep of another potentially huge market – China.

The company has agreed to ship components for assembly by the Chinese into its ZX81 and Spectrum home computers. A factory for the assembly of home computers has been built in Canton, and Sinclair says that large quantities of computer components will be shipped if the initial venture is successful.

Sinclair has signed agreements with the South China Computer Company and the China Electronics Import and Export Corporation, following a recent visit to China by Sinclair's managing director Nigel Searle.

Chinese engineers will visit the US soon for first-hand experience of Sinclair's assembly techniques. Sinclair's UK distributor Prism has won a contract to stage exhibitions in Peking to help UK makers of accessories for Sinclair machines push into the Chinese market.

The Sinclair deal is likely to be followed by many others between western companies and China. Already, factories in China make micros modelled on US and Japanese imports, and Commodore has some of its components made there.

China's aim is to build its own computer industry to serve its home market, and later perhaps to export. Demand for consumer electronics products has rocketed in the last two years.

China fell far behind the rest of the world in technological development after the Cultural Revolution of 1966 to 1970, when many universities shut their science faculties. Now China wants to close the gap by persuading western companies to let her build their machines under licence.

The Chinese market looks especially ripe for the Japanese, because both written languages require a great many characters. Fujitsu has already sold mainframes to China, and Hitachi has produced a range of computers that can handle an input of up to 3,000 characters.

SEARLE . . . Will show Chinese how Sinclair does it.

# Arbitrator says NCR must pay $500,000

by Howard Karten

NCR of Dayton, Ohio, recently lost a dispute with a dissatisfied user and may have to pay nearly $500,000 in fees and damages to the user, the Withrop Community Hospital in Massachusetts.

The decision against NCR was made by a judge from the American Arbitration Association, who ruled that NCR had misrepresented the capabilities of a system it sold the hospital seven years ago. The hospital had claimed that the software was never fully operational.

The award was, however, substantially less than the $3 million the hospital had originally sought.

NCR is declining to comment until the judge's decision to the hospital is upheld by the US district court where the hospital's suit originated.

NCR has lost several cases in the past year.

In the latter half of the 1970s US computer users became more assertive and litigious and began suing computer vendors with increasing frequency.

Many of these cases have been coming to court in the past two years.

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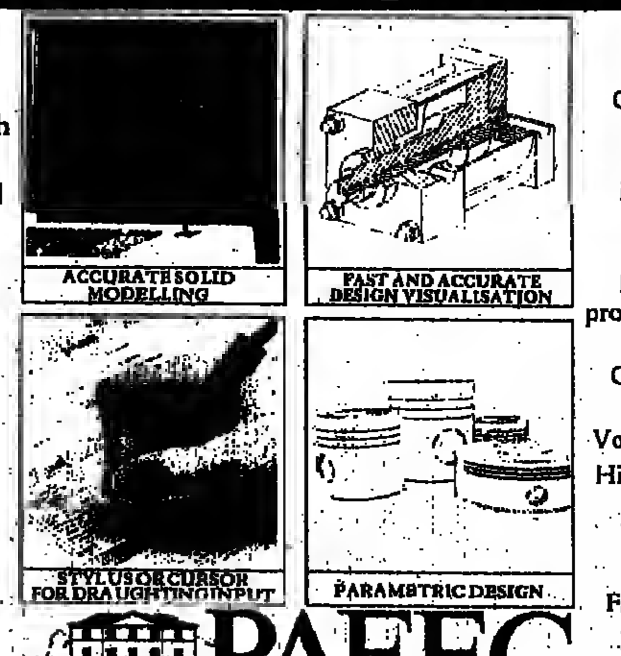


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Some Jobcentres are to be equipped with microcomputers.

# Micros aid jobless

by Caroline Burgess

TWENTY-SIX Employment Division offices will soon receive microcomputers thanks to ideas from their own staff. The MCS called for suggestions from its own staff for projects to improve efficiency by using microcomputers, in a year-long experiment.

A total of 120 offices submitted ideas mainly covering the administration of schemes, accounting, monitoring of community projects and recruitment through jobcentres. Twenty-six projects were then selected to be put into practice.

The successful offices will take delivery of their microcomputers within the next few months and staff will be given special training. The money for the equipment will come out of the Employment Division budget; £120,000 has been allocated for the scheme.

Chief executive of the Employment Division, Bryan Emmett, said that by tapping the imagination and enterprise of staff a number of interesting ways had been identified where technology could be applied to local services and operations.

Aberdeen and Newbury jobcentres were among the offices chosen. Their projects aim to overcome the problems of engaging staff to work for North Sea oil employers, and an effort to identify skill shortages.

The MSC Regional Office in Wales will compile records of its staff's experience and training to help internal recruitment and highlight training needs.

All the projects will be assessed throughout the experiment with the possibility that they may be extended to other offices.

This experiment is in addition to the effort being made by the Employment Division to link all jobcentres to a national computerised job vacancy system.

# West German videotex service is launched – to be replaced in 1984

by Donald Kennett

THE West German Bildschirmtext videotex service had its public launch at last week's Berlin Radio Show as planned – but based on an interim system that is to be replaced next May.

The full public service is to be implemented by IBM under a contract it won at the end of 1981. The trial service, which has been running since 1978, is based on GEC computers running software adapted from Prestel by Systems Designers.

To prevent the embryonic German videotex market from being frustrated by the problems IBM is having in implementing its system, the Bundespost has put more than £500,000 into extending the trial system.

It was adapted to hold a duplicate database in the enhanced display format that is a key element of the full service alongside the Prestel format database. The money has gone on software and hardware from SDL and GEC.

The enhanced format uses a standard developed by CEPT, the Conference of European Postal and Telecommunications authorities in 1981. Bildschirmtext chief Eric Danke said that the Bundespost had planned to use an enhanced display format from the beginning of 1978 and for that reason the number of Prestel-type terminals allowed into the field had been limited to 8,000.

SDL marketing manager Ian Taylor said his company had earned more than £250,000 from the Bundespost this year, and he hoped there would be more support work for it to do during the transition period.

In 1978 the Bundespost was praised for its foresight in implementing gateways to external computers and the UK's Prestel system bought the right to copy that feature. In 1981 it was praised for its determination to get the best of both the UK and its rival French system in its display format.

Now, as its Austrian neighbour looks set to leap ahead with a Prestel-compatible system ordered from GEC only last April, Germany's user frustration is mounting.

Austria is spending a total of £5 million from which its expects to provide a phased introduction of service from the end of this year. GEC won its contract against bids from IBM, ITT and a consortium of French companies.

GEC has also won a £2.7 million contract to implement a public videotex service in Malaysia on a 44-week schedule from last April.


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CIRCULATION


# Academics get a seller

by John Kavanagh

A SMALL UK software house, which started life with an $800,000 contract from US company Digital Research, is aiming for international markets with software from UK universities.

Metacomco developed the product launched in May as Personal Basic by Digital Research, developer of the widely-used CP/M microcomputer operating system. That interpreter originated at Cambridge University.

Now, Metacomco is to launch Bath University's Motorola 68000 version of the Tripos operating system. This will include a version of the Lisp artificial intelligence language developed at Cambridge and Bath.

"It's very difficult to develop products from scratch," said founder and chairman Derek Budge. "Meanwhile there's a lot of good research going on at universities but they don't know what's involved in marketing."

Budge said the Digital Research contract had given Metacomco credibility and good contacts in the US. It has set up a US company and expects to get going there early next year, with some new microcomputer products.

Metacomco was formed by Budge, a chartered accountant, two years ago. It has seven staff, including five technical people. Turnover this year is expected to be £250,000, based on a "fairly conservative" estimate of Personal Basic sales.

Metacomco made a one-off payment for Personal Basic but will pay royalties to universities for other products.

# Intel delivers a threat to OEMs

by John Riley

OEMs are at the crossroads, warned Intel last week after the chipmaker pushed deeper into the systems market and moved closer to the commercial market.

The occasion was the launch of its second wave of microprocessor systems, which it claims to be the first to be built around its iAPX 286 chip.

The systems, called the 286/380 and the 286/310, are for OEMs, and combine the iAPX 286 microprocessor with 80287 coprocessor, with an enhanced Multibus 1 architecture and systems software. Both systems offer Xenix for the commercial market or iRMX 286R, Intel's real time operating system for the technical market.

"The new products affirm our basic strategy to continue to lever silicon technology into new integrated systems," said Bob Kelly, marketing manager of Intel Corporation's System Groups.

"OEMs now have to choose whether to continue with minicomputers or go to micro based systems. With the iAPX 286 base and the Xenix operating system we are in a position to take over traditional minicomputer applications such as multi-user and multi-tasking activities," he added.

By developing systems around its chips and boards, Intel does not consider that it is competing with OEMs. "OEM requirements are changing", said Kelly. "A lack of skilled engineers and programmers is pushing OEMs towards standard board, system and software products, and in any case by buying at higher levels, OEMs don't need to invest from the bottom up at chip or board level, and can invest their resources in applications that they are good at."

The 286/310 integrated system has 512 Kbytes error correcting RAM, four external slots and a 10 Mbytes Winchester, costs around £7,500 and will be available from December. The more powerful 286/380 which has 512 error correcting RAM, 35 Mbytes Winchester and 11 slots will be available this November and will cost between £22,000 and £23,000.

"It took us four years from the launch of the 8086 chip to produce the 86/330 integrated system, and we produced the 86/05 board in between", said Kelly. "But we launched the iAPX 286 chip and the 280/10 board almost together, and now only nine months later we have launched the 286/310 and 286/380."

Intel also launched a family of three 8086 based integrated systems; the entry level system, the 86/310-1, has six slots, 128 Kbytes RAM and costs under £4,000. The other two, the 310-2 and 310-3 are based on combined 8086 and 8087 chips, and offer respectively 256 Kbytes and 640 Kbytes RAM.

"The whole orientation of the upper level of microcomputers is changing," said Kelly. "With the 286 chip we now have the functional capability of a super micro and can perform traditional minicomputer applications. By that I mean the 16-bit super micros can offer multi-user operating systems with standard interfaces, 16 Mbytes addressing, memory protection, multiprocessor bus architectures and high-speed numeric processors."

Intel is developing a 32-bit chip, the iAPX 386, which is expected to have a long term future. "It took 30 years to get mainframes to evolve to 32-bits and that's where the technology stopped, except for special purpose and scientifically oriented machines", said Kelly.

"However, most commercial applications can be served by 32-bit machines, so I think 32-bit microprocessors will have the same type of life span as 32-bit mainframe processors have had."

*KELLY . . . "New products affirm basic strategy."*

At present Intel is working closely with a large number of companies developing the Multibus 2, looking at the 32-bit bus structure for the long term. The spec for Multibus 2 will be out towards the end of this year, said Kelly.

"The move into 32-bits is a long term thing and we want to get the structure right first and work out how efficiently it does tasks before we sort out what applications it will serve", he said. "There are so many people involved."

# Acorn spends $3 million on US ads

by George Block

THE BBC micro maker Acorn of Cambridge is limbering up for the launch of its successful machine in the US with a $3 million nationwide advertising campaign.

It faces very stiff competition in American schools from Apple, Tandy, Commodore and Atari, among others, which have adopted a loss leader approach in attacking the educational market.

"They're virtually giving them away," commented Acorn UK marketing manager Tom Hohenberg. "We won't be copying that technique, because we believe we've got a better package. They tend to just give hardware, whereas we'll be supported by over 200 software packages."

The software has been Americanised and the voice of Kenneth Kendall dropped in favour of an American one.

Last week promotion began in earnest with advertisements in the *Wall Street Journal*, *New York Times* and a number of educational newspapers and magazines.

US sales chief Harvey Lawner said he had advance orders worth $8 millions even before they began shipment in November. There are no plans to introduce the new, lower-priced model the Electron across the Atlantic.

Lawner's team of 30 is likely to be boosted by 10 or 20 before shipments begin.

Hohenberg said the American manufacturers had seemed hell-bent on giving machines away, having overestimated the size of the market.

# Wales wants an unfair share

by John Riley

THE Welsh Development Agency last week geared up its campaign to promote Wales as "technology friendly" by opening a London base for 120 Welsh high-tech companies.

The companies will be able to use the London base, which is situated at the National Electronics Centre near Tower Bridge, for demonstrations, displays and meetings.

The agency is to set up two 60,000 sq ft complexes in Wales next year, at Newport and in North Wales custom designed for high technology industries. One company, Newtech, which develops software for the RM microcomputers, has already booked 20,000 sq ft of space in the northern Deeside Park.

"We want an unfair share of the new technology industry," said John Williams, chairman of the Welsh Development Agency. "We are nearer to London and Heathrow than Scotland, offer substantial incentives, and have got our act together."

# Local authorities go west for their software help

by Caroline Burgess

BROKEN promises, inadequate packages, late deliveries and poor back-up services from commercial software houses have led many local authorities to turn to West Wiltshire District Council for help.

The council is now selling its own software systems. All are developed in-house by local authority staff. "Great emphasis has been placed on developing comprehensive user friendly systems and we now have a range both financial and non-financial, which serves the needs of discriminating professional officers," said Rodger White, the council's group finance officer.

The move to market the systems came about a year ago as a response to enquiries from other local authorities. "It quickly became clear that there were many authorities wanting to use systems which had been developed by local government professionals and had been proved where it matters – in the offices of those who rely on them to do their job," said White.

Bracknell District Council is one local authority that turned to West Wiltshire. "We were caught on the hop by the housing benefit legislation and let down by one commercial software house. West Wiltshire came to the rescue very quickly," said Pat Dober, Bracknell's deputy housing manager.

"We have no resources for developing our own systems. We are dependant on buying and really get no help from computer companies, even though ICL is situated very close by."

West Wiltshire's first customer was West Somerset, whose computer manager, Alan English, said: "Any software package is a compromise. West Wiltshire's was as close as we could get to our needs. Its systems are also much cheaper. We use one system from a commercial firm but the back-up is not very good.

"The housing benefits scheme was very complicated but using their system we had the problem sorted out on time," he added.

West Somerset claims to have saved £30,000 in the first year since using a computer for rate collection. The money saved has been used to expand the computer system.

"Local government people understand local government needs – we speak the same language," said White. "We have the knowledge of the legislation, a lot of which is open to interpretation, so we know what is needed.

"We organise demonstrations to suit who is coming. We get a local council officer to explain how it works as one professional to another and show the advantages."

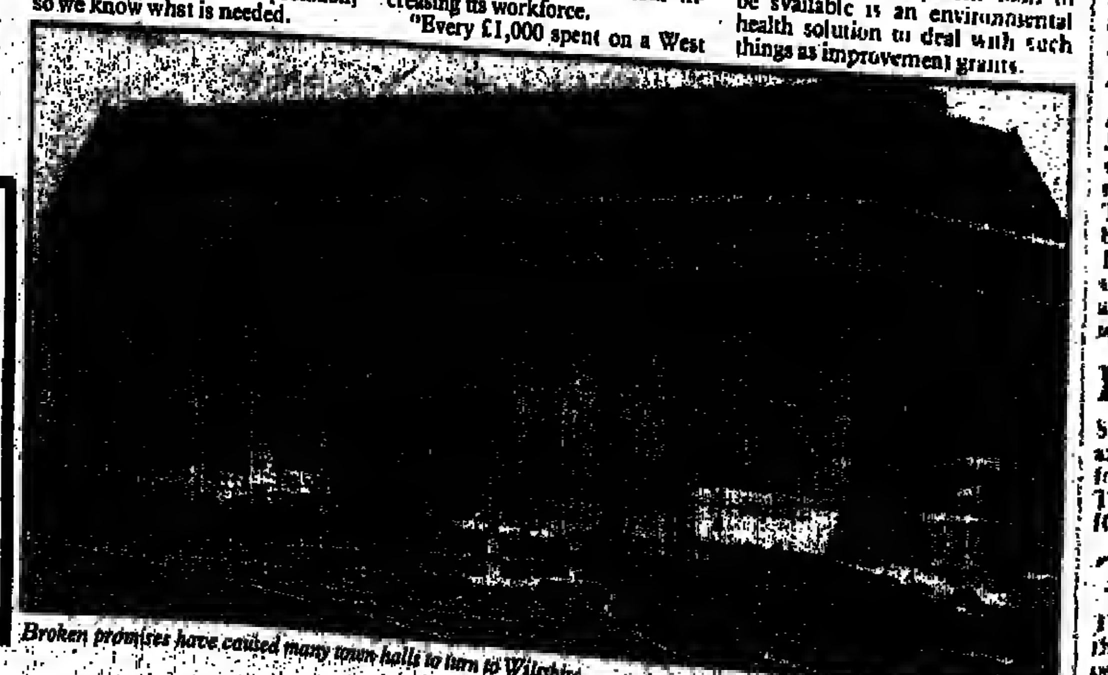
West Wiltshire District Council was at one time used as a demonstration site by ICL. It also took part in last year's ICL road show which, according to White, helped to spark interest in their packages.

As West Wiltshire has been an ICL user since 1975 products are aimed mainly at other ICL users. It now has 50 online terminals for its 170 staff from its ICL 2955, which allows the council to deal with new legislation without increasing its workforce.

"Every £1,000 spent on a West Wiltshire system saves the purchasing authority at least £3,000 in its own development costs," claims White. "The money saved can be used to keep rates down or on other services."

The money received for the sale of West Wiltshire's systems goes into its general rate fund. At the moment it is saving about 1p in the pound on rate demands. About 200 systems have been sold to 20 local authorities.

Software packages available include, rates, rents, direct debits, housing benefits and estimates. One future development soon to be available is an environmental health solution to deal with such things as improvement grants.



*Broken promises have caused many town halls to turn to Wiltshire.*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## SALES BRIEF

### Plessey wins £4 million export order

PLESSEY Office Systems has secured a contract worth £4 million over two years to supply digital PABX systems in the 24 to ... line range to Emirtel (the United Arab Emirates telephone authority). Deliveries will start later this year and are expected to be in the region of 200 to ... switches per year. Competition for the contract came from the US, Japan and France. Plessey has ... launched the CDSS range in the US and earlier this year it gained a multi million pound contract for CDSS equipment from Telenokia, a Finnish electronics group.

### Vector's biggest

VECTOR International signed two contracts this month. One, its biggest ever, valued at over ... million came from GTE ATEA to upgrade existing equipment. The second, worth $200,000, is a repeat order from Nafta NV for turnkey systems to automate ... fuel loading on to tankers.

### Timber order

NIXDORF Computer has received an order for its 8870 ... computer system from Interwil, agent and broker of timber. The order includes six VDUs and ... printers and will be used in Interwil's London and ... offices. Interwil also ordered ... Comet accounting software package.

### APL travels

MICROAPL, the UK ... microcomputers running the APL programming language, has shipped its first ... machine across the equator. The computer, a Motorola 68000 based machine with 12 Mbytes disc storage, will be used in the Republic of Vanuatu in the Pacific to ... agricultural statistics.

### China orders Irish

A DUBLIN micro manufacturer has won two contracts in China. Data Controls, which ... microbased monitoring and remote control systems, has ... one contract worth ... £200,000 for Hong Kong ... another estimated at £50,000 ... mainland China. The equipment will control water supplies. The company has already ... contracts for the Irish National ... Gas Board and the electrification of the railway in Dublin.

### Gould sale

A GOULD 32/27 system with ... CAD workstations and ... software for vehicle design has been ordered via ECS Graphics ... Walter Alexander and Company Coachbuilders. An additional two workstations for purchasing and control will also be supplied.

### Prosys purchase

A DEC VAX 11/750 with ... Mbytes of main memory ... several Apollo DN300 workstations have been installed at Prosys Technology, a new Cambridge based CAD company. The VAX 11/750 will be used for engineering simulations while the Apollos ... aid the development of CAD software products.

### KL's Set buy

SET Systems has picked up another £750,000 order from ICL for its Option Selection Terminal, taking the total order value from ICL to £1,750,000 this year.

### Telemetrix order

TELEMETRIX has moved into the North American market with orders worth £500,000 and the opening of its first sales and service subsidiary in the US.

# Dalkeith shuts as ICL puts Perq in Kidsgrove

by John Kavanagh

ICL is moving all development work on its Perq scientific workstation to one centre in Kidsgrove, Staffordshire, and closing its Dalkeith software operation near Edinburgh. All 80 technical staff will be offered jobs in Kidsgrove but eight administrative jobs will be lost.

Meanwhile a new version of the Perq is imminent.

ICL says the Kidsgrove move is proof of its commitment to a product which it admits has not sold as well as expected in the first two years. In addition the Cadcentre – now partly owned by ICL – is planning to use the rival Apollo Domain for its push into the US.

About 500 Perqs have been sold by ICL at £18,000 each, yet the company has over 130 staff working on the product. And that 500 includes 100 for internal ICL use in applications ranging from hardware design to software development and producing graphics for presentations.

Another 200-plus have been taken by universities, polytechnics and the Science and Engineering Research Council, leaving between 150 and 200 in commercial and industrial companies.

US firm Three Rivers, which developed the Perq, has sold another 500. Three Rivers covers North and South America and Japan while ICL has the rest of the world. Apollo has also sold just over 1,000 of its Domain machines.

ICL Perq marketing manager Reg Chamberlain said sales would double to "a couple of thousand" next year and take off in 1985. Managing director Robb Wilmot was "absolutely committed" to the product and the company was investing more in it than ever before, he said.

Chamberlain said the take-off had been slow because it was difficult for users to appreciate the benefits of the Perq.

"Everyone is extremely impressed by the graphics and power but it's hard for an engineer who is used to a shared batch service or a dumb terminal to realise what a single-user workstation means," he said.

The Perq has also been hit by software problems. ICL has come under fire from university users for delays with its Unix operating system, PNX. There have been cases of Perqs gathering dust while users waited for PNX because they saw no point developing software for the Perq's original POS system when an industry standard system was coming.

ICL and the Science and Engineering Research Council were working on separate versions of PNX until last autumn, when ICL killed the SERC project and worked full tilt to produce its own product.

Chamberlain said the first release of PNX had been available for some months and ICL was about to publish a catalogue of applications software.

There were over 40 software developers with products ready or on the way, he said, especially in computer-aided design and manufacture, engineering and document production.

Chamberlain said the Perq price had not restricted sales. "The alternative is a shared minicomputer. The constraint is the lack of appreciation of what a Perq can mean to users."

The Perq 2 was announced in the US by Three Rivers early this year. Its UK launch is "very imminent". The new version offers more memory and disc storage rather than radical processor differences.

■ White-collar union ASTMS is consulting the Dalkeith staff this week over the Kidsgrove move. "We're not formally doing anything yet," the union said. "But eight admin staff have not been offered relocation."

*BAXTER . . . "Not withdrawing from the hard disc unit market".*

# Commodore gives Tandon a breather

by Caroline Burgess

COMMODORE is taking a break from the hard disc market, while it gives Tandon a chance to improve its drives. Many complaints regarding the reliability of Tandon disc units have prompted Commodore to stop supplying its own label products for the moment.

"We are not withdrawing from the hard disc unit market," said John Baxter, Commodore UK marketing manager. "We are not selling them at the moment because they are not good enough and if they need to be repaired they have to go back to the US.

"Tandon is not capable of producing a reliable hard disc unit at present. We are advising our dealers to go elsewhere if their need is urgent."

This is good news for some. One recommended supplier, Mator, claims that it has been inundated with orders from Commodore dealers.

Mator reckons its orders have doubled, and instead of customers ordering one or two some are ordering 10 or 12. It is the 10 Mbyte unit that is selling best.

"No one seems to know what Commodore is doing," said Michelle Knight, Mator's sales manager. "But we are able to meet the demand.

"For the last six months people have been replacing Commodore with Mator".

# Crystal is far from clear

by Keith Holder

ASTON Technology's Crystal 68000 microcomputer has run into stiff opposition – because of its name. There is another Crystal, or more correctly a group of companies, based in Torquay, which have been marketing a range of products, including hardware and software under this name, for over 20 years.

Crystal Research, one of the group, has put the matter in the hands of its solicitor with a view to prohibiting any use of the words Crystal products by Aston Technology. "It has caused us a great deal of embarrassment," said Trevor Brownen, Crystal Research managing director.

The whole situation arises over a legal grey area. A word such as crystal cannot be registered as a trade name, as it is descriptive.

# Belgium puts £6m in office

by Jack Gee

THE Belgian government has announced that it will spend 500 million francs (£6 million) on office automation this year and double this annually from 1984 to 1986.

Announcing the new move, the government's Ministerial Committee for Economic and Social Coordination said: "Our objective is to enable Belgium to set up an industry with the capability to manufacture complete office automation systems which involve a maximum number of components, products and sub-systems with high added value and of Belgian origin."

The government was also concerned about guaranteeing its own sources of supply from Belgian industry because the Civil Service was a big customer for these systems.


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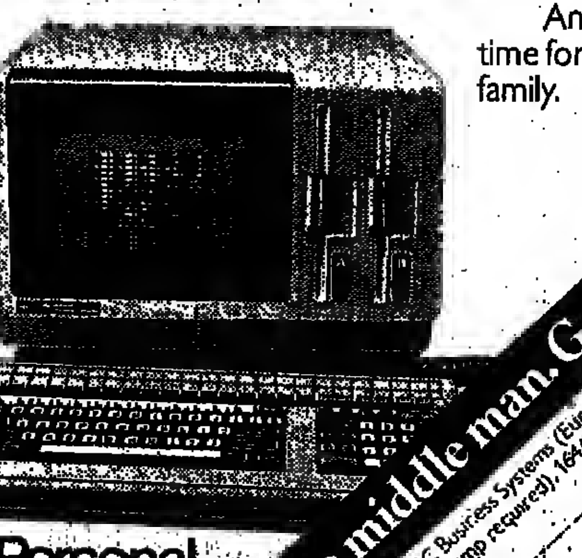

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# French are the tops for service

by George Black

THE French dominate the services scene with 10 of the Continent's top 20 companies, says the 1983 survey by the European Computing Services Association.

"Apart from the appearance of Thorn EMI there has been little radical change in the relative revenue positioning of major European companies," the report says. BP's subsidiary, Scicon, at number two after IBM, is the only other British company to figure in the top 20.

The French strength is attributable to third placed Societe Generale's SG2 group, which has 4,290 employees — more than any other organisation listed; the government's CISI, placed fourth; Cap-Gemini-Sogeti, second largest with 4,000 staff, which came fifth; GSI, eighth; and Sema Metra, which came tenth.

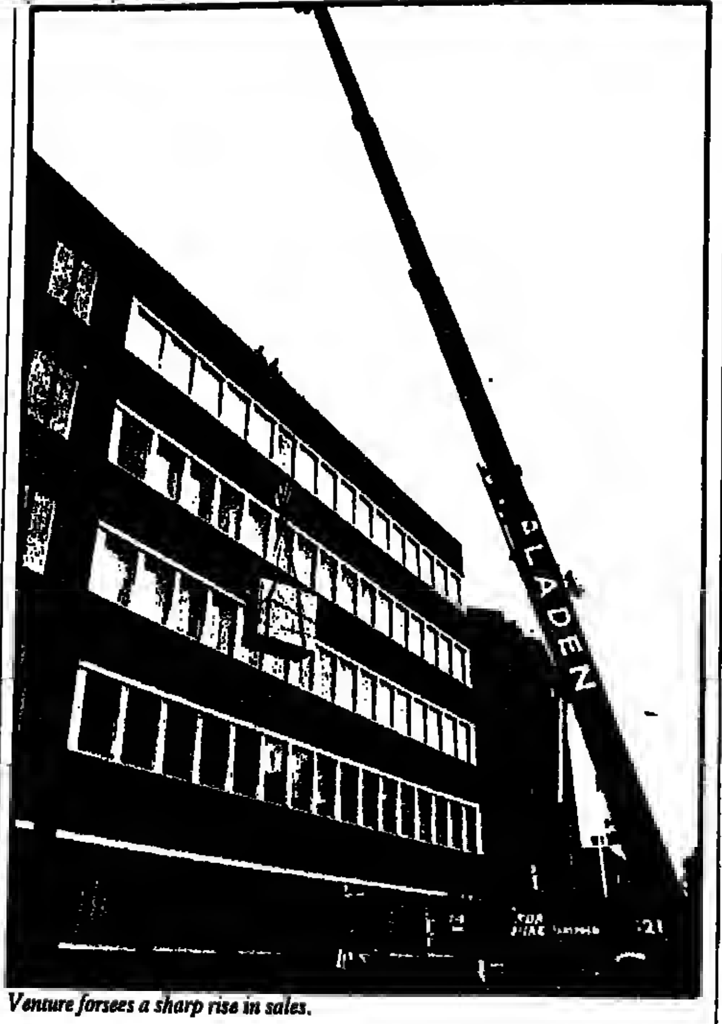
IBM managed to generate $180 million from its remote and batch computing services division, which was the corporation's only division considered in the survey. Scicon, whose activities included in the survey software products and services, was a close runner-up with $175.4 million. It moved into the second place, despite having fewer employees at 3,500 than two of its main French rivals.

Thorn EMI's appearance in the charts is due to its takeover of two thriving properties, formerly belonging to British Oxygen, bureau Datasolve and systems house Software Sciences. The group came 25th — one place after Logica.

Along with IBM, Americans continued to take a largish slice of the market. General Electric's systems house, Geisco, ranked sixth, netting $150 million from a mere 1,200 employees.

Control Data was the only other big American mainframe maker to be listed, at position 12. ICL's consultancy and training section appeared only at number 20, because only the firm's software products and services operations were taken into account.

Best performing German outfit was the tax advisers' co-operative, Datev, which came ninth. The Italian Finsiel, part-owned by the Banca d'Italia, was seventh. And several smaller European countries showed evidence of up-and-coming concerns, such as Sweden's Datema, part of the Johnsson group; the Belgian CIG; and the Danish Kommunedata.



*Venture foresees a sharp rise in sales.*

# Langton aims for third spot

by Donald Kennett

LANGTON Information Systems aims to be number three supplier of private videotex systems next year with a package it has developed which runs as a CICS application program on IBM mainframes. The current top three suppliers are ICL, Rediffusion Computers and Aregon.

Langton's videotex products manager Barry Ashdown said: "We believe that the next generation of videotex products will be integrated with mainframe data processing and that PIII is the first of perhaps many integrated products."

Langton was one of the first companies to develop a videotex product when in 1978 it launched its Preview package, which converts IBM databases into videotex format. It is also part of the AGB Research group which runs a videotex bureau service from its computer centre in London.

PIII is claimed to allow virtually all users of IBM and plug compatible mainframes to get a trial videotex system running very cheaply, with the videotex terminals able to access existing mainframe databases and interact with mainframe application programs.

A four-port trial system costing £25,000 can easily be expanded at a cost of £400 a port to handle up to 200 ports, according to Ashdown. This compares with a cost of more than £100,000 for developing a system in-house.

Alternative IBM communications arrangements would also cost considerably more, Ashdown said. PIII uses a specially adapted version of the Videogate videotex terminal concentrator originally developed for Thomson Holidays' network by Micro Scope.

This handles up to 31 videotex terminals, performing validation on data collection operations, providing frame editing facilities and compiling access statistics.

The system is also capable of supporting terminals using the new CEPT European standard for videotex, which incorporates facilities for enhanced graphics.

*ASHDOWN . . . Believes in mainframe integration.*

# US shipments set to top $100 billion

by George Black

US computer shipments will be nudging the $100 billion mark next year, predicts the Massachusetts market analyst Venture Development Corporation.

Venture foresees a sharp rise in sales from only $51 billion in 1980 to around $92.4 billion in 1984.

In its latest report* it calculates the industry's growth rate over the first half of the decade as 15.9%; and it expects 1984 to be better than 1983, with the rate of growth increasing from 14.1% to 15.4%.

Software and services are taking a bigger slice of the cake, not surprisingly. Mainframe sales are slowing down and may only grow 2.7% this year. Even minis are likely to boost revenue only by 15.6%.

Against this the personal computer market is going through a boom phase and should net an extra 35.9% this year. Mainframes will probably lose a further 13% of the market over the coming four years.

The annual income derived from software and services is predicted to grow at 20.6%, from $5.5 billion in 1980 to $11.7 billion in 1984. Applications programs are doing particularly well, pushing up their share of the business probably to 27% next year.

Supermini sales topped $1.6 billion in 1982, which was up 36.7% on the previous year, according to another new Venture document.† The inquiry attempts to nail down the term "supermini" which it notes has become vague.

Venture defines it as having a CPU with an internal word length of 24, 32 or 48 bits, maximum main memory of one megabyte or more, logical address space of one megabyte or more, and using a bus structure, not a typical mainframe point-to-point structure.

Computational superminis took more than 40% of the market in 1981, but by 1986 general purpose business systems will have edged them out, it says. Their sales will "seem to explode", rising to 36.1% of the market. Real time, computational and timesharing systems can also expect to prosper.

*The US Computer Industry, Annual Review. †The Superminicomputer Industry 1981-1986, A Strategic Analysis, both from VDC, 1 Washington St, Wellesley, Mass 02181.

# Vermont drums up memories

by John Kavanagh

DRUM memories, like punched cards, might be on the way out, but there are still some good orders to be won. This is clear from a £160,000 contract for Vermont Research to supply drums to Plessey Control for its telex exchanges.

"The market is declining, but we're increasing our market share," said UK sales manager Paul Callus. "Drums are still ideal where fast access and high reliability are needed. The biggest application is telecommunications; for example in telex and telephone exchanges. Bell Telephone uses our drums worldwide.

"Drums are more expensive than discs, but we have an access time of seven milliseconds, compared with 50 to 70 on a Winchester disc. And some of our drums have been in 10 years and never needed a service call."

Vermont is staying faithful to drums: it recently announced its biggest device, with 9.6 Mbytes of capacity. But it is also moving into the disc business. Last year it launched an eight-inch drive with 10 Mbytes of fixed and 10 Mbytes of removeable disc.

The progress of this product has pushed up the value of Vermont shares on Wall Street in the last six months. Vermont is a $15 million firm with operations in the US and the UK.

## BICC disappoints

CABLES group BICC has turned in a disappointing performance for the first half year, with pre-tax profits down 60% to £33 million. But financial analysts expect a strong recovery in the second half of the year as the company reaps the final benefits of 35% staff cuts over the last four years, and its final year profit is expected to be about £85 million, compared with £98 million last year.

## Infomatics buy

INFOMATICS, one of the largest US software houses, has taken over Creative Data Systems (CDS), the Ohio-based supplier of retail and distribution packages. CDS has installed 80 Wang-based systems, and its products will now be sold by Infomatics Distribution and Retail Systems Division alongside existing packages for wholesalers.

## Datasouth dollars

US PRINTER maker Datasouth has raised $16 million by going public on the New York stock exchange, to help develop a new high quality printer. The company, which has its products distributed in the UK by Datatrade of Northampton, has been more successful than some rivals at seeing off Japanese competition, and has sold 28,000 of its DS 180 matrix printers.

## Brown Boveri up

THE Brown Boveri Kent Group of instrumentation and process control specialist companies has doubled its pre-tax profit from £1.3 million to £2.7 million on almost unchanged turnover of £58 million for the half year ending June 26. The group credits a restructuring for the gain.

# How to feel your way around Unix

by Claire Gooding

FINDING your way around Unix is a hands on experience: hands on the screen, not on the keyboard. University researchers at Essex have developed a finger touch method so that the user can simply point at whatever is wanted on the screen.

The idea is to make Unix much more accessible to the non-programming community, including users who are not used to computers, let alone the complexities of Unix. One of the main problems facing Unix in its new commercial role is the degree of specialised knowledge needed to get from point to point. Most screen editors demand more skill than naive users are prepared to acquire.

Several products giving Unix a friendly interface have been launched, but according to University of Essex researcher Peter Jones the problem is a more fundamental one of the man-machine interface.

Jones told the meeting on the European Unix user group in Dublin last week that most devices available at present were far from ideal for simple tasks. Such devices as touch pads and joysticks were off screen and therefore put a "cognitive gap" between user and Unix.

Other methods such as mechanical joysticks were not reliable.

"It's very natural to point," said Jones. "Even if your mother always told you it was rude. So why not use something which is obviously inbuilt to communicate with machines?"

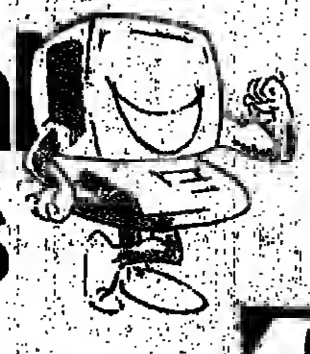
Jones' system uses infra red light beams to pick signals from the user's finger when it touches the screen. "The cursor is positioned above the finger, so that you don't obscure what you're doing," explained Jones.

Jones says that the method follows the Unix tradition of doing simple things well, although it might turn out to be tiring.

Yet to be resolved is the safety factor. Most manufacturers have not considered having users in physical contact with their equipment, and so X-rays may be uncomfortably close for the touch input user.

In its favour is the price Jones has in mind for the system. "If you only have to spend $500 on a terminal, why not spend another 500 on a device to communicate properly?"


hp Personal Computers



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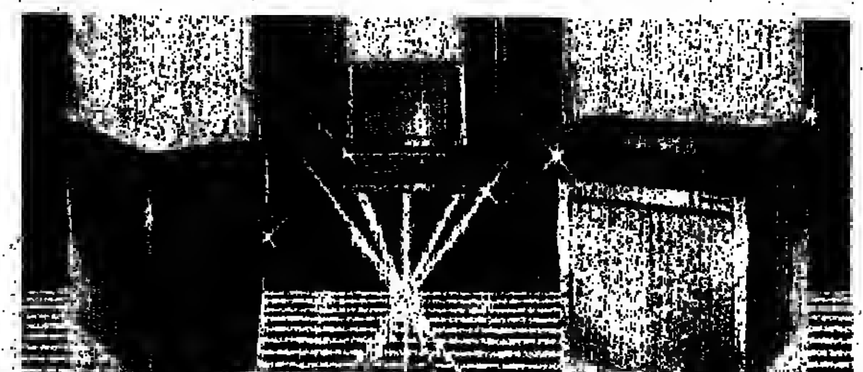

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MICRO PRICES

# Will Christmas bring gifts for micro makers?

## Kevin Cahill looks ahead to the end of this year

*Will Santa Claus have goodies lined up for the micro manufacturers?*

THIRTY dollars by Christmas is the uncomfortable forecast being made by American dealers for the Commodore VIC 20. This is exactly half the generally agreed manufacturing cost of the device, and a third of the lowest known price at which Commodore is willing to wholesale the machine to dealers.

How, then, can this forecast be met? Easily, according to the following line of reasoning.

First of all, the marketplace itself is hanging. Secondly changes are being imposed on it by Commodore's aggressive boss, Jack Tramiel, and thirdly, further deep changes are being wrought both in the market and in people's perceptions by an eclectic titled Englishman, one Sir Clive Sinclair.

Maybe it was Sir Clive's elevation to the peerage early this year that inspired a thoroughly old-fashioned English stockbroker, with a degree of prescience unmatched by the slow public school drawl of its proprietors, to write to its clients and tell them that there were only two micro makers fit to stay in the business.

They were Sinclair Research and Commodore International.

In conversation with one of the partners in the firm, who refused to be identified, Commodore was picked out for the unoriginal reason that it knew how to "make it cheap and pile it high".

And, of course, Commodore is a fully quoted company and therefore suitable for investment, which Sinclair Research isn't as yet.

Besides, the same gentleman, in his lightly blue striped tie (Eton), said that he didn't really know yet what Sinclair Research did.

From an investment point of view, Commodore shares have travelled a smart uphill route since last year. Unlike several other paper fortunes made in the American stock markets recently, which have tended to dissolve as fast as they materialised, Commodore has made its blue chip price stick with its brilliant results.

But there is a fair chance that while the Old Etonian's advice may have worked, it may have been for the wrong reasons. When it really comes to "building 'em cheap and floggin 'em fast", no one can do it better than Sir Clive.

He has, single-handedly, made the UK the world's most computer literate nation.

*SINCLAIR . . . Single-handedly, he made the UK the world's most computer literate nation.*

He has done it, some commentators assert, not because he is the electronics whizzkid suggested by the national newspapers, but because he can read a component list faster than anyone else in the market, spot the trends, and build a device fast enough to catch the same trends.

Tramiel, while marching in part to the same Asiatic mice drum, is also marching to another tune, of a slightly more sophisticated composition.

At the Hanover fair this year Tramiel told *Computer Weekly* that there was a market out there for 50 million micros.

"Only 10 million of those will be business computers.

"Twenty-five million will be home computers and 15 million will be personal computers," he said.

By 1986, the year in which Tramiel suggests that the market will be taking his forecast number of machines, there is every chance that the price of a home micro will be the same as the price of a pocket calculator now – around $20.

Tramiel himself often mentions the business he did almost as much to create as Sir Clive, that of pocket calculators.

"In 1968 we sold pocket calculators for $1,495. Eight years later we were selling the same calculator for $9.95."

It is almost as if Tramiel is trying to ignore the very market he is doing so much to create and shape.

The ZX81, or Timex 1000 as it is known in the US, is already selling for less than $30, and there is talk of the Spectrum Timex 2000 coming down to under $50 by Christmas.

If the forecast which opened this article is met, then Tramiel will have forced a very interesting price fall on Sinclair. The estimated cost of manufacturing the ZX81 has been put at $7-$14, and of the Spectrum at $23-$28.

At $50 this would still leave a margin for Sinclair and Timex, but not if those two machines have to follow the VIC 20 down below the 30 mark.

With Tramiel talking about a home machine costing $100 by 1986, and his own current home machine heading rapidly for a third of that price, someone has to be wrong.

In practice, no one is wrong, and Tramiel may well have exposed a major flaw in Sinclair's strategy.

American dealers are already selling VIC 20s at a loss, or even going around to their local Safeways to buy them for at least a no loss "sell on".

The reason most of them give is that they hope to make up the profits on the sale of software.

In this respect they may be batting on a good wicket. A forecast for the toy industry made about two months ago shows that there is a growing trend for people to buy games cassettes for their home computers, rather than for the specially constructed machines made by games companies like Atari and Mattel.

The reason for this trend is simple. Games cassettes for the small micros tend to cost about £5 to £7, rather than the £10-£15 it costs to buy games cassettes for specific games machines.

Dealer optimism is further buttressed by statements from executives at Commodore, who are forecasting that 50% of the company's future revenues will one day come from software.

But are the independent dealers being fooled? More and more, Commodore in the US is selling its machines through big chain stores like Sears and Safeways.

This is making the home computer user into an impulse buy consumer, rather than the interested afficianado the independent dealers like to think of him as.

One thing the big stores won't do is take a gamble on future profits based on the as yet unseen revenues from an emergent, still largely unprotected, software market.

This argues that Tramiel can actually build his machines for even less than US industry analysts calculate, and is selling them for less than anyone has so far revealed.

Back at Sinclair Research, we still have a predominently hardware-oriented company, pursuing profits through low cost peripherals and low priced hardware sales.

There is no sign that Sinclair is ready to convert Sinclair Research into a mixed hardware/software company, though.

The issue of who is right is likely to be decided in the huge retailing chains of the US, where pile it high and sell it cheap is still, as ever it was, the received wisdom and gospel.

On balance, the US analysts, still shell-shocked from the disintegration of Atari and the decimation of Texas Instruments, are tottering towards the view that, while Commodore may win greater market share, Sinclair will win a position equivalent to the one now held by Sharp and Casio in the pocket calculator market.

Interestingly, there is no sign so far that the Japanese either understand or intend to compete seriously in this new bottom end home micro market.

Only Sord has introduced a Sinclair look-alike in the West, the M5, and that machine, at £150, looks very overpriced compared with the Sinclair Spectrum, now costing less than £130 for the 48K version.

NEC has a range of small home and personal micros widely available in Japan, but has made no attempt to introduce them in the UK yet.

Is Jack Tramiel prepared for war against Apple, IBM and DEC? They truly have the big battalions, but have they the right strategy?

Tramiel says that he isn't going into battle directly against the big three, but then one of the hallmarks of the Tramiel strategy, at least as stated and then carried out, is that in the classic mode of the light infantry, he can change his direction and speed with minimal disruption.

Texas Instruments went down because it got not only its price wrong, but prior to that, its cost of manufacture.

There are plenty of those who doubt that Apple, still with the status of the Apple III unresolved, has got its cost of production right, least of all by asking £8,000 for its Lisa.

Tramiel has frequently promised his poor man's Lisa, Magic Desk, and just as frequently failed to deliver it.

But what is certain is that Tramiel will deliver the Desk soon, and that it will help to [illegible] aggressive edge of the Lisa [illegible]

DEC and IBM, despite [illegible] amazing sales to date, remain mainly dependent on "corporate" originated orders, and are [illegible] down there on the [illegible] Tramiel and Sinclair.

Nor are they ever likely [illegible] Both Tramiel and his [illegible] val are pursuing the [illegible] dividual, and [illegible] from the parallel market [illegible] software that has made [illegible] and machines more [illegible] the games machines [illegible] developed for the games [illegible].

Tramiel has also [illegible] possession of a hand-held [illegible] 256K, 32-bit microprocessor[illegible].

When that hits the market, [illegible] who is going to pay £3,0[illegible] 128K of 16-bit [illegible] Even companies such as [illegible] said.

*TRAMIEL . . .*


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هكذا من الأصل

NEWS ANALYSIS

# French technology faces its most sweeping reorganisation

**Jack Gee predicts there will be a massive concentration of French muscle in the electronics, IT and energy industries**

THE most sweeping reorganisation of France's high technology industry since world war two has entered its final planning stages in board rooms and government offices: the outcome is likely to be a mssive concentration of muscle in electronics, information technology and energy, the sectors on which the competitiveneas of the French economy depends.

New battle lines are being drawn between the two most powerful firms in these key industries, Brandt and Compagnie Generale D'Electricite (CGE), both of which came under state ownership 18 months ago.

Georges Pebereau, 52-year-old managing director of CGE looks like emerging as the winner in a contest for power against Alain Gomez, chairman of Thomson and eight years his junior.

Thomson's activities in information technology, office automation and telecommunications seem on the verge of falling into CGE's lap. Thomson is expected to take over CGE's military equipment division and to concentrate on electrical and electronics consumer products ranging from kitchen cookers and videotape recorders.

CGE's assumption of command over lesding edge technology reflects its outstanding performance as the only nationalised firm which reported a profit last year.

Its 190,000 workers, whose jobs range from building nuclear generators to selling digital time division telephone exchanges, earned the group 638 million francs (£53 million) in 1982. Thomson, with a staff of 129,000, lost 2.2 billion francs (£183 million).

The division of the spoils between Thomson and CGE is the result of a cannily-played game of Monopoly which has engaged Gomez and Pebereau throughout the summer, with Minister of Industry and Technology Laurent Fabius, President Francois Mitterand's favourite whiz-kid, as umpire.

Government officials say they are waiting for the two corporation chiefs to present their proposals and are not involved in the negotiations. But senior civil servants, including Pebereau's brother Michel at the Ministry of Economy and Finance, are known to have spurred the business chiefs on.

Massively indebted socialist France cannot afford to pour huge subsidies into loss-making business activities which are being conducted on a grand scale by nationalised industry, particularly at Thomson.

Industrial observers say the French telecommunications industry will have to shed 22,000 surplus workers over the next year

**Massively indebted socialist France cannot afford to pour huge subsidies into loss-making business activities which are being conducted on a grand scale by nationalised industry**

following the shrinkage of orders for the successful E10 telephone exchanges built by CGE's subsidiary CIT-Alcatel and the failure of Thomson's MT 20 and 25 exchanges to make any sizeable dent in the world market.

French Telecom and Thomson recently flew a group of French pressmen to Chile to show their switching system operating in riot-torn Santiago — one of the few world capitals where it is functioning without serious technical problems.

Thomson's problems are symbolic of the failure of nationalisation to produce the incentives to investment and employment which President Mitterrand set the big names of French industry when the state took them over.

A report by the National Statistical Institute (NSI) published last week says: "Staffing in the public sector is shrinking just as fast as in private industry".

Until nationalisation, investment in the public sector was more sustained than in private firms, the institute recalls. But in 1982 investment dropped by 8% in state-run businesses and 7% in the private sector.

Although Thomson's problems did not all begin under socialism, those of its biggest subsidiary Thomson-CSF which embraces the military and computer markets, are newcomers. Thomson-CSF registered the first losses in its history in 1981.

In the framework of efforts to establish a viable computer industry in France, Thomson's minicomputer division was handed over to Bull, in which the state holds 80% of the equity and Honeywell the remaining 20%.

However, the group retained its military computer activities. These are not scheduled to be transferred to CGE which is negotiating with Olivetti in order to acquire the 35% stake in the Italian firm previously held by French glass-maker Saint Gobain.

In the redistribution of responsibilities now under way CGE can be confident of developing France's nascent office automation industry in co-operation with Olivetti.

CGE's managing director Pebereau gets on splendidly with Olivetti's chief executive Carlo De Benedetti, for whom he has immense admiration. French industrial observers say the two men are cut from the same mould and have similar talents for man management.

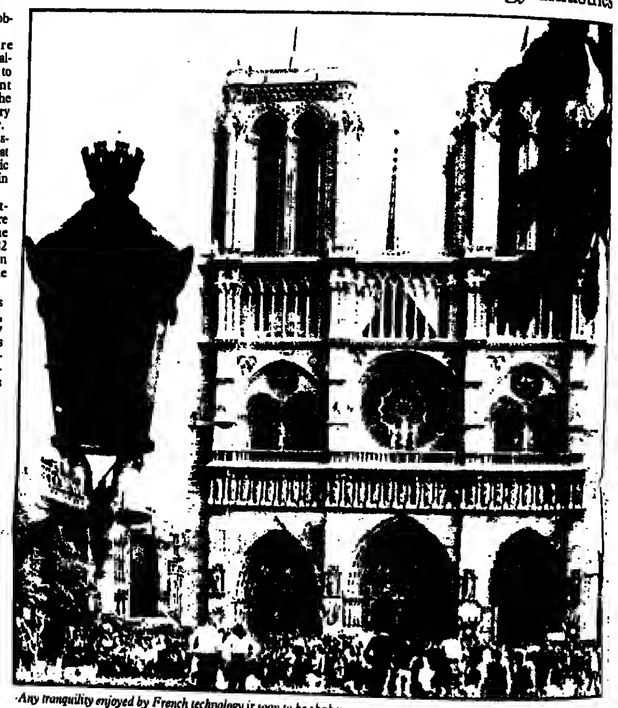
Gomez, grandson of a Spanish anarchist, has a different approach. "Over the years I have derived genuine pleasure from firing incompetent managers and people in charge who put at risk the employees who enjoy no responsibility at all," he says.

Gomez played a major role in the socialist party as an economic adviser to Mitterrand until the change of government in 1981. But Thomson's poor performance could sound his doom.

He recently uttered what might prove to be his own epitaph at Thomson: "A boss who succeeds is somebody who is able, with the same men, raw materials and environmental and market constraints, to get more productivity and added value. More profit, if you like. That means rigor and discipline but also orderliness."

Even if Thomson retains its military division, which is heavily dependent on computer technology, this is unlikely to restore the firm's finances to good health. Thomson-CSF steadily turned in profits until two years ago by taking 40% advances from Arab states for military orders and then earning money from the bank by investing it. Now, with only 10% paid on signature of contracts, this source of plentiful revenue is no longer available.

The transfer to CGE of its telecommunications division, although the source of massive losses, would be a serious blow to Thomson which only recently acquired ITT's nationalised Telecom activities. The jobs of at least 6,000 of the 8,500 employees of ITT's subsidiary Compagnie Generale De Communications Telephoniques are now considered to be in serious jeopardy.



*Any tranquility enjoyed by French technology it soon to be shaken.*

**The division of the spoils between Thomson and CGE is the result of a cannily played Monopoly game between Gomez and Pebereau with Mitterrand's favourite whizz-kid Laurent Fabius as umpire**

*FABIUS . . . Minister for the Budget*

Senior executives at Thomson who got warning of the talks about between Gomez and Pebereau have taken evasive action where they have been able to do so. A number of top telecommunications specialists moved from Thomson to CGE in recent weeks.

If CGE becomes overlord of the French telecommunications industry, as now seems probable, there will be gnashing of teeth at the Ministry of Telecommunications. Telecom minister Louis Mexandeau successfully fought France's last Industry Minister Jean-Pierre Chevenement's efforts to marshal Thomson's and CIT-Alcatel's activities under a single umbrella company which would have been dubbed Telephone de France.

Now, only six months after Chevenement was dropped in a government reshuffle, his plan looks like reaching fruition.

But French Telecom is hostile to the prospect of having no choice between rival telephone switching systems or other equipment. Export customers will certainly react in the same manner.

It is still unclear what roles will be reserved for computer maker Bull and Matra, a leading electronics firm in which the state has a 51% stake, following a carve-up of high-technology activities between Thomson and CGE.

Thomson has been promised that it will retain its leading role in developing electronic components. But it is not yet able to supply French industry on a big scale.

CGE's position on the French Monopoly board is likely to be further reinforced if its chairman, Jean-Pierre Brunet, takes a career position in the French nuclear industry.

The company makes the generators from France's pressurised water reactors which were developed from Westinghouse technology. General de Gaulle chose the American PWR design in preference to CGE's boiling water technology in the 1960s.

CGE again found itself on the sidelines in 1975 when President Valery Giscard D'Estaing ruled that Framatome, a subsidiary of the Creusot-Loire firm which is itself part of the Schneider-Empain group, should be France's sole reactor builder.

Now Schneider, which lost 600 million francs (£48 million) last year from its steel activities wants to divest itself of this burden. The government is ready to hand over the foundries to the state-owned Sacilor and Usinor steel firms. In exchange Schneider would sell 35% of its 70% stake in Framatome to CGE.

France's publicly owned generating authority, Electricite de France, and the French atomic energy authority, which has a 3% holding in Framatome, oppose a move which would strengthen CGE's hold over the nuclear industry and give it a monopoly role.

But the concentration of power at CGE and the specialisation of electronic consumer production at Thomson are regarded by many industrial observers as a logical solution. "Franco-French competition" (meaning contests between French firms for foreign orders) has been a bogey phrase of the government since it took office.

As other European firms ally with the Americans and Japanese to safeguard their markets, the division of labour between CGE and Thomson looks like a rational answer to present day problems.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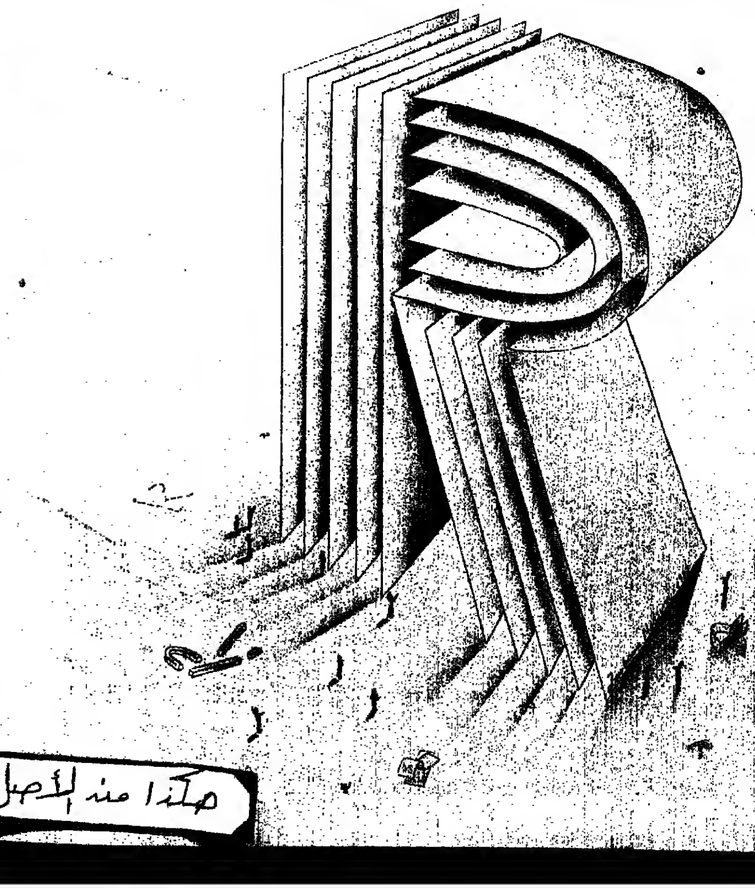

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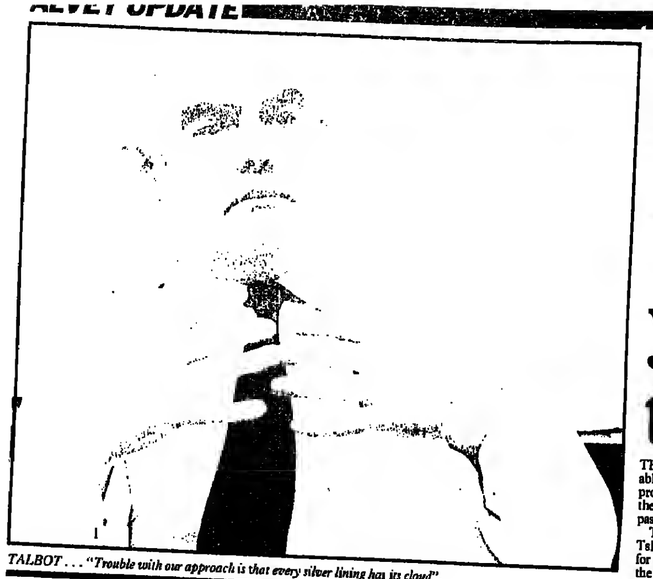

TALBOT . . . *"Trouble with our approach is that every silver lining has its cloud".*

**The directors of the Alvey programme, the national five-year plan for the fifth generation of computers, are now setting up an internal communications network based at their Millbank headquarters in London.**

**By next week all the key people in the scheme will have their own workstations which will later be linked by British Telecom's PSS to the remainder of the participants. The network will provide an electronic mail service using SERCnet, the Science and Engineering Research Council system, initially based on the so-called grey book protocols. These are protocols developed by the universities' computer board, which will eventually be modified by the directors to bring them in line with International Standards Organisation protocols.**

**Derek Barber of Logica, who is the director responsible for the Alvey programme's infrastructure and communications, is organising the publication of a regular Alvey newsletter.**

**As the directorate prepares to put the fifth generation show on the road, two of its directors, David Talbot, the software engineering chief, and Chris Barrow, who takes charge of the man-machine interface aspect, talked to George Black about their backgrounds and their hopes for the plan. . . .**

# 'Japan thinks 20 years ahead... we think in months'

THE software business should be able to offer users the same improvement in value for money as they have had in hardware over the past 20 years.

This is the firm belief of David Talbot, who is to be responsible for developing British expertise in the programming field to compete with international competition.

He was a programmer himself in pre-Cobol days, having entered the fledgling industry 23 years ago after reading maths at Oxford. He made a false start to his career in the Air Ministry as a scientific officer before deciding the interesting work would not compensate for the low pay. Keen to get in at the beginning of a new subject, he considered joining Bull or IBM, but opted for the freshly-established ICT.

He helped to install some of ICT's earliest systems, including a tape machine for the pharmaceutical firm Pfizer, eventually being promoted to technical support manager in Leeds. During his seven years in the North, ICT progressed by swallowing English Electric, EMI and Ferranti's computing interests, and emerged as ICL. While this was happening Talbot switched from the technical to the business side and became ICL basin systems manager in Leeds.

Returning South in 1973, he was closely involved in the creation of the 2900 mainframe series and in finding its first customer, the Defence Ministry.

> **When I came into the industry with machine code and a biro, you had to spend a million pounds on hardware to get anywhere. Now it's a thousand pounds. We need to bring about the same improvement in software**

In the latter half of the decade he took charge of liaison with the universities, government departments and the Common Market. With the arrival of Robb Wilmot as managing director he moved to Slough to become business manager for mainframes.

Now he is on secondment to the Alvey team at the invitation of its director Brian Oakley – but will not decide until the end of two years whether he needs to prolong the sabbatical.

"I didn't expect to be offered this post as I had not been doing the groundwork for the project. But I thought it was of such importance that I was flattered and enthusiastic about joining."

He admitted that other countries had begun their fifth generation effort earlier and were spending far larger sums, both from public and private sources, but he argued that the issue was not the amount invested but whether we got value for what we spent.

When in West Germany he was impressed by the amount its government was putting up for the computer industry – but noted that it might well have regarded its early results as disappointing. The Germans looked to the UK where they regarded the relationship between the government and ICL as exemplary.

Both the Germans and French had come to recognise that data processing – soon to be rechristened information technology – was a cash-hungry business in which world standards would apply.

The Japanese, like the French, identified IT as a sunrise industry and have hitched their high technology firms to government in long-term undertaking.

"Unlike Western economists the Japanese are thinking about 20 years ahead, while we are all worrying about the next few months. The trouble with our approach is that every silver lining has its cloud."

Not even IBM could "go it alone" in this climate of fierce international rivalry, said Talbot. He referred to the fate of the PL1 language, designed to supersede Cobol and Fortran, yet hardly denting their established sites despite IBM's massive marketing strength.

"The moral is that we have to serve one another's real needs – hang together or be hung separately' is the message going through the trade now."

Therefore the Alvey team will not be developing a new language or operating system but was concentrate on creating tools that people would use.

"When I came into the industry with machine code and a biro, you had to spend a million pounds on hardware to get anywhere. Now it's a thousand pounds. We need to bring about the same improvement in software."

People had prophesied that Cobol would bring about the demise of the programmer and would mean that managing directors would soon be talking directly to their machines. The reality has been that there was no such dramatic progress in software to match the advances in hardware.

A tenfold improvement in productivity was not a sufficient inducement to DP managers to switch software, he said.

He was looking for a breakthrough in formal specification methods, an area that had received less attention in Britain than in the US up to now. "Most jobs come a cropper before the first line of code is cut," he said.

And the reliability of programs must be defined and measured as accurately as was hardware performance – another field that had been seriously under-resourced.

He will also be inquiring into ways of ensuring that these new techniques are fed back into commercial use. He wants the government to play a leading role in encouraging its adoption, as the MoD has already done.

He wants to introduce a method of getting the more expensive items of software for a trial period, to reduce the investment risk that so often have deterred organisations from taking on new and better systems.

At the same time the universities should be persuaded to use the tools so that students emerging into industry would already be trained in them and would carry their expertise into the outside world.

# My role – to make the research staff work in harmony

BARROW . . . *"A lot of businesses have shunned new technology just because the man-machine element wasn't right".*

**I think fear is the principal impetus behind this. It's a pity perhaps that it has to be so, but what will really influence people to get their act together is fear of being overtaken by the Americans and Japanese**

MANY smaller firms have been deterred from spending money on new technology because the products available were not user-friendly enough, according to Chris Barrow.

He has been picked to head the Alvey directorate's venture into improving the man-machine interface.

Barrow came into the computer industry in 1950 as a student apprentice with Siemens Brothers. He saw the company's British interests taken over by AEI and later by GEC. Siemens helped him to do a part-time electronics degree course at Northampton Polytechnic.

At Siemens he worked with John Flood, now a professor at Aston University, on one of the earliest electronic switching groups in the formative years of the subject.

When GEC took over Siemens he decided to leave, and joined Pye TMC (Telephone Manufacturing Company) which had become part of the Philips empire. There he became part of a small group working on semi-custom design and pioneering PAX and PABX design, in what he described as "almost a prophetic situation. – CMOS still hadn't arrived then, it was still PMOS techonology."

After two years he was given the opportunity for an internal move within Philips to work with Keith Warren, now one of Plessey's senior managers, in Holland. The project involved the development of pulse code modulation techniques to Post Office specifications and included a major study of the Dutch phone system.

Two years were spent adapting that system to the British environment; one of the products that emerged was patented by Barrow. This scheme led to a contract awarded to the Pye branch at Orpington, where he was based by then, to install a system for the Jersey Telephone Board, one of the first exports.

He was back in Holland again between 1977 and 1979 in charge of an applications team, in which time he got to know continental engineering and organisation fairly thoroughly. He left Philips after 12 years and joined Plessey as chief of its advanced development group within Plessey Office Systems at Beeston, Nottingham. He was Plessey's technical executive responsible for PABX designs.

His name was put forward by Plessey when top information technology firms were invited to name people to make a contribution to the national programme. He had already served on the man-machine interface working party for the report prepared by John Alvey of the Post Office.

Why was he chosen? "I think one reason was my great interest in long-term research and development and my connection with the Common Market's Esprit project."

He represented Plessey on Esprit's office automation panel, one of the committees set up by the 12 major European companies backing Esprit. He described himself as a convinced European and said taking up the Esprit post had been "like putting on an old shoe for me".

He thought it very important to ensure that the two endeavours were co-ordinated so that their labours were complementary and not duplicated.

How did he define the man-machine interface? He outlined three main broad areas of work that he would include in it. The first centred on human factors: "this is the area that is now normally called ergonomics in which we have to consider the cognitive aspects of the problem. We have to increase the mutual understanding of man and machine and we have to tackle the organisational problems of many users all on the same machine."

The second area was that which encompassed pattern recognition, image processing, speech recognition and synthesis, and script recognition, topics which the National Physical Laboratory among others has been active in researching.

Thirdly he cited display technology as a field in which progress could be expected. The universal acceptance of cathode-ray tubes as the means of display could be challenged by flat-screen alternatives operating at low voltage.

Two main advantages of the flat screen could be that it could be incorporated into the desk – "it could be the real desk-top computer at last, in fact" – and that it allowed users to write directly on to the screen.

A general strategy document covering all three of these areas is in preparation now and is expected to be issued by the Alvey directors by the end of November.

It will identify the areas in which research work will take place and make recommendations on how the man-machine interface community can best be brought together with a single direction.

"One of the chief problems of this part of the programme is that effort has been scattered around, split into small working units in the universities. It needs to be focused. We must create a feeling of togetherness and use that to form consortia which will eventually produce the goods."

Already there were a number of proposals from various organisations which were being written up, which gave him encouragement.

"We in Britain have done a lot of good fundamental work, but so far it has not filtered back into products – and this is no less true in man-machine interface, MMI, than elsewhere."

One of the immediate tasks would be to form a part-time advisory board to speak authoritatively on behalf of the MMI community. Its primary task would be to bring together all the current knowledge. Members would come both from universities and government research establishments and from the user world. The major difficulty would be to make the board representative.

The importance of MMI to the whole Alvey programme was in enhancing the attractiveness of products to users, he emphasised. "Sales of products are very dependent on what we can achieve in the MMI area. We must remember that a lot of work is going on in the US to attack these problems, especially in companies like Xerox and Bell Labs."

He agreed that the Americans were spending far more money on the next generation of computers than the British, but said it was still far too early to judge what the result of the race would be.

"It's easy enough for anyone to give an opinion on whether we're spending too little too late – but it's harder to actually back up that opinion with sound evidence. The truth is that only time will tell."

There was a right and a wrong time for launching such programmes, he argued.

Probably three or four years ago there would have been a general reluctance to participate in such an undertaking, even by those who were now saying it was too late.

The objective was that in five years time, when the penetration of computer technology into industry would be far greater, they would be able to support much more user-friendly products.

"We can reduce the resistance of the consumer by making things more usable. There is a limit to how many systems you can simply shovel into the mouth of the consumer. A lot of businesses have shunned the new technology just because the man-machine interface element wasn't right for them."

The diverse MMI community spanned several disciplines – from psychology to physics – and several different types of industry, from the design of cockpits for military aircraft through to terminals for secretaries. His role was to make the researchers work in harmony.

Esprit had gone forward pretty fast considering the many difficult problems it had to overcome, he said, but Alvey might be able to advance faster because of its smaller team. All the top staff are concentrated together in a few rooms at Millbank.

The willingness of companies to get together and pool their resources has been impressive both in Esprit and in Alvey, he said. People had begun to see the advantages of working side by side and reducing the risks involved. This was significant because scientists generally had in the past looked to the US for an example, rather than to their colleagues closer at home.

"I think fear is the principal impetus behind this. It's a pity perhaps that it has to be so, but what will really influence people to get their act together is fear of being overtaken by the Americans and Japanese."


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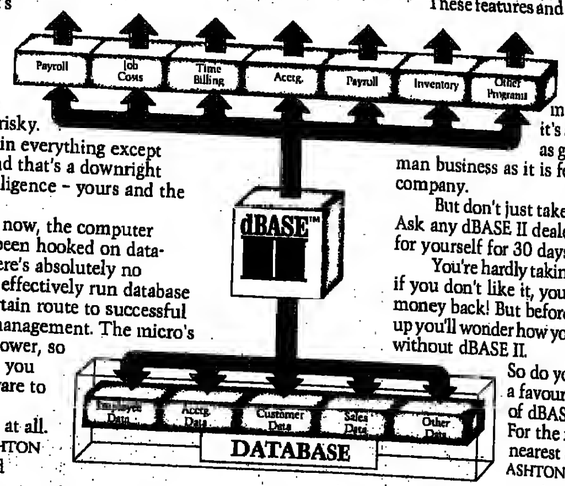


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SOFTWARE FILE

# Cobol generator goes on micros

by Claire Goodlog

ONE of the first Cobol application generators to make its way on to microcomputers is to be distributed by Cobol firm Micro Focus. The Sourcewriter application generstor from Softwright is to be sold alongside Micro Focus' range of Cobol products for a single-user licence fee of £750.

Micro Focus already has a loose marketing agreement with Information Systems Research Inc for the RIMS/MPG Cobol generator, which works across a range of DEC kit. Sourcewriter at present works on a variety of Z80-based microcomputers, including those running CP/M and MS-DOS, and the IBM Personal Computer under PC-DOS.

According to Micro Focus marketing manager Peter Hewitt, the two products will not conflict, partly because the sales relationship is closer in the US than in the UK. "There's such a wide market ready to be tapped that the two systems won't need to compete. RIMS tends to sell into end-user sites; Sourcewriter is aimed at technical users at the analyst level."

Like RIMS/MPG, Sourcewriter generates code which can be amended by hand. It works on a data dictionary principle which allows the system to establish complex relationships between individual data items.

"Sourcewriter is closer to being an applications generator than a code generator," said product author Martin Anderson.

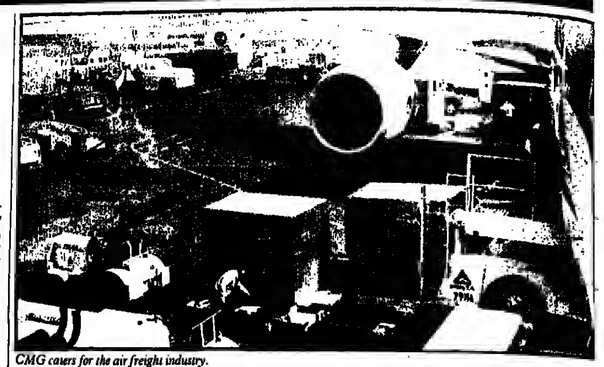
"It grew out of mainframe techniques and is designed to use fairly intelligent fourth geoersion ideas, centring on database," he explained. "Apart from being the first product of such sophistication available on microcomputers, it is unusual because it starts with the data structure: top down design, in other words."

Sourcewriter designs the files and then the programs in detail, allowing the designer to change screens and even more rigorous specifications as the system develops. This "prototyping" ability is not common among applications generators.

"Another feature which makes Sourcewriter unique is that it will not produce gobbledegook code. The chances are that if a program compiles it will be sensible and run properly," added Anderson.

The product generates source code in CIS Cobol which can then be compiled using Level II or CIS Cobol compilers. Tests quoted by Micro Focus show that using Sourcewriter, between 500 and 1,000 tested lines of Cobol per man day can be produced.

*ANDERSON . . . "It will not produce gobbledegook code".*



*CMG caters for the air freight industry.*

# Air freight system takes off

AN air freight system designed to cater the market has been launched by CMG Information Services. The system is under development at the Greenford branch of CMG, which overlooks Heathrow Airport.

Apart from having air freight on its doorstep, CMG was prompted to develop its CMGAIR system because it felt that no one supplier had managed to meet the specific needs of the air freight companies.

"The system has been developed alongside the air freight forwarders themselves and is being tested at one of the world's largest air freight firms," explained CMG Information Services joint managing director Chris Hennessy. "We've designed it for medium to large companies which felt their needs weren't fully catered for."

CMGAIR works on IBM System 34s, and costs about £25,000 for the basic package, and £32,000 for the System 36 version. Installation and maintenance cost an extra £10,000, but CMG is convinced that the benefits of increased profitability more than justify the outlay.

The system can cope with different inputs such as telephone bookings, and shipping instructions, right up to the export of consignment. The various modules dealing with freight operations, accounting and job costing are all integrated so that data is automatically passed between them.

# Perkin-Elmer makes the queries easier

SUPERMINI manufacturer Perkin-Elmer has taken another step towards programmerless programming. It has added a query facility aimed at end users as an extra option in its Reliance relational database.

The Reliance Update System, RUS/32, accesses the Reliance Plus database so that staff can create, update or delete records as and when they wish.

Perkin-Elmer has been strengthening its software offerings as part of the move away from the scientific and engineering image and into commercial Unix-based systems. The Reliance Plus database was developed in the UK for online transaction processing and database management, and has been a major factor in Perkin-Elmer's push to become a supplier of total systems.

"We're committed to supplying products for increased programming productivity," explained marketing manager Fred Mascarenhas.

"The long-term goal is to reach the point where you can eliminate programmers from the process altogether. No-one's got there yet, but we are moving close with this sort of tool."

RUS/32 follows the fill-in-the blanks technique, which means the user simply has to follow the screen prompts. There are help messages to guide how to fill in the screen forms, and an inquiry key which displays the names of files, fields and other items which have to be entered.

As well as launching RUS/32 Perkio-Elmer has improved its reporting and query facility RQL/32 so that parameters can be used to ring the changes on queries that have already been saved.

*MURRELL (left) and MORRIS . . . Opening up new market.*

# 20 outlets planned for time costing system

TWO Norwich accountants are so pleased with the time costing system they have been using that they have set up a new company to market it.

They are John Murrell and Mark Morris, of Shemur Management Systems, who have had their system, SMS Time Costing, enhanced and packaged for dealers by software specialist Rak – who happen to share the same office.

The original program was written by Peter Dearnly, a lecturer in computer studies at the University of East Anglia. Now it has been added to by Richard Webb, director of Rak, for selling mainly to medium-sized solicitors' and accountants' practices of between two and ten partners.

Morris said they had been surprised to learn from professional colleagues that few packages in use had the time-costing feature, though it was fundamental to all their work.

"We did some market research and found that a lot of them lacked the necessary management information and did not have straightforward reporting," he said.

"Not enough thought had been put into them in the race to sell the hardware. But we've been through the learning curve ourselves. We don't live in cloud-cuckooland."

Now they are establishing a dealer network for the new product, intending to have at least 20 outlets. The program is in Micro Focus' CIS Cobol and runs under Digital Research's CP/M and MP/M micro operating systems.

Morris said it could be used by any business where time was being charged, down to units of six minutes, so architects and advertising agencies could be interested.

"What we've done is take out the tedious manual labour and provide some very simple reports," said Morris.

*Software File is compiled by George Black.*

# UK company bids for micro database market

by Claire Gooding

A NEW UK company is aiming to break the US stranglehold on the micro database market with its own relational database and applications generator.

Datafit, described by its originators Datafit Ltd as "a total methodology, not just a program generator," is being launched in London this week.

The team behind Datafit comprises two systems programmers, Chris Belk and Tony Montgomery-Smith, and public relations consultant John Brace. Their interest in fourth generation software techniques led to an experiment, for which Belk and Brace bought the computer. After three years of development, the experiment had developed into a fully fledged product, and the three are now building Datafit into an international company.

The product won the backing of Barclays Bank, then the NCC Software Products Scheme, which matched the personal investment made by the Datafit team with a £160,000 grant.

Datafit is aimed at small companies which cannot afford an in-house programming team, as well as the large conglomerates which use distributed database techniques as well as central processing.

"It's for the six-man company, right up to the multinationals," explained Belk, who is a director of Datafit.

The system is selling for £8,000 to £10,000 including the Commodore Communicator on which it runs, five or 10 Mbyte disc, printer and applications.

The price puts Datafit into the same category as the "adult" micro databases such as MUBS and the relational databases like Informix and Oracle, rather than competing with data management systems like Ashton Tate's dBase II. "Hopefully we are offering the kind of service that hasn't been available to micro users before now," said Datafit operations manager Michael Cross. "It's very difficult to compare it with anything."

Datafit's unique ability, according to Belk, is that the system allows "prototype" applications to be built interactively. Specifications can be changed as the user decides exactly what the requirements are, and the software can go on changing even when it is up and running.

Datafit consists of one large database file, which can be added to or changed in any way.

"The whole system is motivated by mainframe principles," said Belk, "and we've managed to put them down on to micros. There are practically no limits to the complexity of the applications Datafit can produce: if you write it by hand in Cobol or Pascal, then we can provide it."

# Database writs fly

A FOURTH company has been pulled into the £500,000 lawsuit surrounding a magazine review of Bristol Software Factory's Silicon Office microcomputer database system.

Bristol Software is now seeking legal advice on possible action against another database firm, Compsoft, which is using extracts of the review in publicity material.

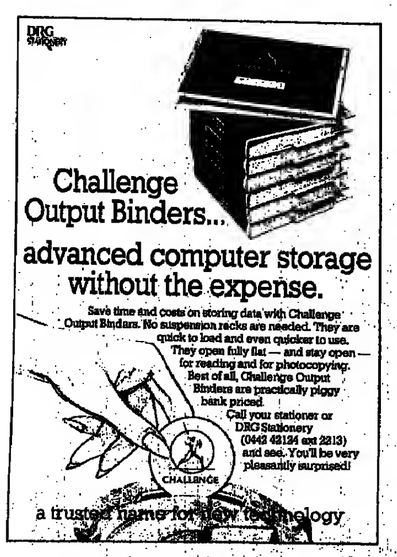
The lawsuit is against *Personal Computer World* magazine and reviewer Dr Kathy Lang. Bristol Software claims the review had 13 errors and that it has cost £500,000 worth of business since it appeared in December.

The company is also applying for an injunction against Microcomputer Business Systems to prevent it using an allegedly misquoted version of the review in promotional literature.

But Compsoft said Lang was the industry's most respected and thorough database reviewer. Its Delta product came top in sort and select tests. It sent extracts of the review to its existing and potential dealers last week.

"We think Bristol Software has a very good product and I like the people there," said Compsoft marketing director Heather Kearney. "We're not even in direct competition."

She added: "I hope this action won't prevent magazines doing these independent reviews, because they are very valuable to the industry."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## COMPANY NEWS

# Network firm wins £250,000 investment

by Caroline Burgess

BEALE Electronic Systems has secured £250,000 of new investment to enable it to continue the development of Hilan (high integrity local area network).

Hilan is being developed by Beale with the aid of Scicon.

Beale, which specialises in equipment for industrial environments, claims that Hilan will overcome the problems of dirt, heat, explosive atmospheres and breaks in cables. It will use fibre optic links rather than conventional Ethernet cable.

The new investors are Thames Valley Ventures and Investors in Industry (formerly Finance for Industry). Most of the money will come from the former. Directors of the company are also increasing their investment.

Roger Beale, one of the directors, said: "It would not have been impossible to continue with the Hilan project, but difficult. We can now speed things up."

Nicholas Beale, managing director, said: "This investment will be used to expand the company, to aid in capital investment and to finance our development programme.

"The Hilan project is exciting considerable interest here and in America, where I had talks with a number of major US companies," he added.

At present Beale employs 20 people, half of whom are working on the Hilan project. Its aim is to double turnover each year, reaching £1 million by 1984 and £2 million by 1985.

# Battle of giants due next week

by Kevin Cahill

IN a week's time Dr Lewis Branscombe follows Dr Gene Amdahl as the keynote speaker at the International Information Processing Conference in Paris.

The scene is likely to produce the first public confrontation between Dr Amdahl and IBM since he founded his new IBM compatible mainframe company Trilogy two years ago, and will be the focus for perhaps more attention than IFIP has previously experienced.

Amdahl is now informally talking about a 40 million instructions per second (mips) uniprocessor for delivery in 1985, while the best that is expected of IBM is a 14 mips machine in the same year.

Not only will Branscombe be on the spot, since the performance of the IBM machines is his direct responsibility, but there is some speculation that IBM may try and use the occasion to begin their counter campaign to the Trilogy machine.

But there is far more at stake than just a debate between two eminent scientists about whose technology is faster.

Branscombe told an audience in Germany last month that "the computer power demand on the data processing facilities of our largest commercial customers is growing at 40 to 60% a year." This meant, Branscombe said, that IBM needed to produce the highest performance processors for the commercial world "that our technology permits."

He is now facing an unprecedented challenge from Gene Amdahl to prove that IBM can deliver the high power it speaks of.

Branscombe's problem is that, despite the huge resources of IBM, he does not have the time to amend the company's design programme for the Sierra, as the IBM answer to the Trilogy range has so far been called.

The Gartner Group recently produced an analysis of the Trilogy technology which showed that, by implication, it would be many orders of magnitude cheaper to manufacture than IBM's comparable technology.

The Gartner assumptions were based on the relative cost of the substrate board in the IBM machine, which carries all the inter-chip connections, and the Trilogy chip, which internalises the substrate board into the chip itself.

Beyond the technology issue there is the role many commentators believe IBM has taken on of being the technology leader, and IT representative of the US in the world — summarised by one magazine as an attitude of "what's good for IBM is good for America."

AMDAHL . . . . Talking of a 40 mips uniprocessor by 1985.

When Branscombe spoke to the scientists in Germany he also referred to the need to provide networks so that scientists could remotely access supercomputers.

If this is any indication of how IBM intends to approach the supercomputer issue, then he is in for a further surprise from Trilogy.

The Trilogy machine range will come with a 100 mips array processor as virtually standard equipment, so Gene Amdahl is not leaving the bottom end of what Branscombe himself referred to as "the explosion of applications variety" in supercomputing, to the Crays and CDCs of this world.

IBM, presumably under Branscombe's personal direction, has 400 staff engaged in developing supercomputers, although IBM's abandonment of this market occurred well over a decade ago.

Gene Amdahl is scheduled to speak about the history of computing, a good deal of which he was personally responsible for building, both when he was at IBM and later.

*Computer Weekly* will be on the spot to bring you details and analysis of what promises to be an historic encounter of the supercomputer kind.

# Datastream beats forecast with £2.3m profit

by Philip Hunter

INVESTORS in computer information specialist Datastream, which went public in March, [illegible] not complain about the company's results for the year ended [illegible]. Pre-tax profit was £2.34 [illegible] against a forecast of £2 [illegible] from analysts for the prospectus.

The figure is 64% up on [illegible] year's £1.43 million [illegible]. Turnover was also well up [illegible] 23% — from £8.26 million to £10.23 million.

But the directors admit the performance of the shares [illegible] far been disappointing. They rose 8p to 210p on the news [illegible] has still not come near the [illegible] price of 225p, when the company came nine times oversubscribed [illegible] the market.

The official company [illegible] that an age of reality has [illegible] the stock market and that [illegible] high technology shares [illegible] longer shooting for the moon [illegible] this view is hard to buy [illegible] Microfocus has since come [illegible] market and seen its [illegible] more than double.

The real reason, perhaps [illegible] something to do with the [illegible] nature of Datastream's [illegible] ness, and with fears of [illegible] competition from Reuters.

And the company [illegible] market in the rather [illegible] fashion of not fixing a [illegible] 15% of its shares offered [illegible] public. Instead potential [illegible] ets were asked to tender [illegible] great enthusiasm they [illegible] offered rather too much [illegible] pany had indicated [illegible] would be adequate.

## SHARES TABLE

*The shares table, which is specially compiled for Computer Weekly [illegible] selected computer companies that reflect the state of the computer [illegible]*

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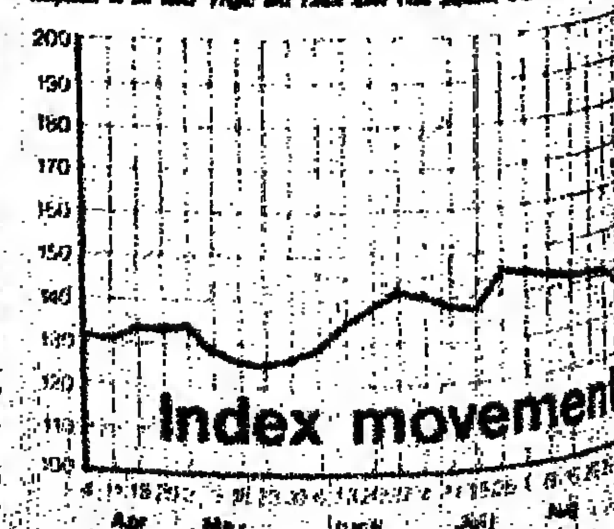
*The table shows the closing prices on Thursday. The Share Index is based [illegible] companies in the table [illegible]*



MORTIMER, NIXON and LANSDOWNE (left to right) . . . "Decided to have a go, because we saw there was such a gaping hole."

# Trio to turn over £¼m on home programs

by Nuala Moran

THREE women are building a software business on writing educational programs for home computers. Their programs are so successful that the high street home computer retailers are knocking at the door, and turnover is likely to reach £250,000 next year.

The company, Ampalsoft, is based in Cheshire. Although it has only been going for 12 months, it has already developed and is marketing a full range of programs called the Cheshire Cat Educational Series.

The company resulted from the joint brainwave of Patricia Lansdowne, Lynn Nixon and Ann Mortimer. Between them they have seven children aged from two to eight years — and three Dragon 32 micros.

The brainwave was not in recognising that there was a need for more educational programs for children, but in realising that between them and their husbands they had the expertise to make and sell such programs.

Patricia Lansdowne said: "We decided to have a go, because we saw there was such a gaping hole."

Ampalsoft was established last October and sold its first package in March. Lansdowne said: "If we continue to sell packages at the same rate as we have in the last two months, then we are heading for a £250,000 turnover in the year beginning this October."

The three founders started out with programs for their own Dragons, and now have a series of programs ranging from learning how to use the Dragon, to a range of maths programs.

O-level programs for French, German and geography, and beginners' level physics, chemistry, computer science and general science will soon be available.

All testing and evaluation of the programs is done by the three founders who have worked full-time to build up the company. The programs were prepared by teachers of the subjects, who, according to Lansdowne, "got involved because they liked it."

About 40 people have so far been involved in preparing the programs, working on a part-time or consultancy basis. There are no full-time staff, apart from the founders, but Lansdowne said they expected to take on a full-time programmer before Christmas.

At the moment the Cheshire Cat Educational Series runs only on the Dragon 32, but Oric and BBC micro compatible programs are on the way. There are plans to make the programs run on all major home computers.

*Boots* is currently promoting the Dragon and has bought several thousand of the programs. Ampalsoft's products first went on sale in Currys Micro C shops.

Lansdowne said: "We developed the packages and just sent them off to the major high street retailers to see what they thought." The company has also approached John Menzies and Dixons.



## MICRO NEWS

# CCTA opts for Sony disc drive

THE governmeot's Central Computer and Telecommunications Agency (CCTA) has settled on physical specifications for a recommended microfloppy disc drive. But its choice from the clutch of contenders in the sub 4-inch stakes, Sony's 600 rpm 3½-inch drive, is the least well supported. Even Sony is seemingly moving away from this drive in its attempts to promote standards worldwide.

"At the moment we have just decided on the basic specifications," says the CCTA's Dennis Morley — who has responsibility for advising government users on microcomputer hardware. "If any department wants microfloppies and sees a need to interchange data with others, it should go for this drive."

In the Sony camp this seal of approval from the CCTA is welcomed. "It is one of many boulders that will start rolling towards standardisation," says marketing manager Robin Allison. "Perhaps it will affect governmental agencies elsewhere."

Already commercial organisations outside the CCTA's original group look like joining the bandwaggon. The Inter Bank Research Organisation has contacted Morley, and the National Computing Ceotre has offered to work on recommendations for logical formats.

But rival drive suppliers Tabor and Hitachi believe commercial pressures, fuelled partly by competition among alternate sources for *the same* drive design, will have more effect than the CCTA recommendation in determining which way equipment manufacturers jump. Price/performance and reliable second sources will weigh heavily in decisions.

"I still find it surprising that the government's technical body has done no assessment of the technical merit of the various drives," says Brian Arnott, European marketing director of Tabor.

"The decision is what we expected all along. I am disappointed, but not surprised. It is not going to make things any easier, but that's life."

There is a band of drive manufacturers lined up behind the Sony 3½-inch size, but these have plumped for a 300 rpm unit more readily compatible with existing 5¼-inch floppy formats.

Sony, too, will be delivering these to OEMs soon, and in the US has aligned with Shugart and Tandon in putting this device forward to ANSI for a proposed standard.

ALLISON . . . "Perhaps it will affect governmental agencies elsewhere."

# Scotland could win another 1,000 jobs

by Nuala Moran

SCOTLAND looks like winning another microelectronics plant, creating 1,000 jobs. The £60 million factory is to be built by International Micro Electronics Products (IMP) of San Jose, California.

The Scottish Development Agency (SDA), the body which promotes industrial development in Scotland, has a £620,000 investment in IMP in the form of half a million preference shares. In exchange, the SDA got a commitment that if IMP expanded overseas it would come to Scotland.

One possible site for the plant is Livingstone new town, which is situated to the West of Edinburgh. George Gray, managing director of IMP, has been reported as saying that he wants the factory to be in operation by 1986.

He said that if the European market develops according to plan the final investment will be around £60 million.

If the investment does reach £60 million, there will be 1,000 employees by the end of the 1980s or early 1990s. When the plant is first set up, it will employ about 300. A firm decision on whether or not to go ahead with the development will be reached by March 1984.

IMP itself was only set up in 1981. Its turnover is currently running at around £13.4 million. It manufactures and designs integrated circuits, and the Scottish factory would be involved in wafer fabrication as well as engineering for customised chips.

Part of the attraction of Scotland, as far as IMP is concerned, are the research and development opportunities offered by the Scottish universities. And Gray himself already has experience of the Scottish electronics industry, having been in Scotland with a former employer.

A spokesman for the SDA explained that this was the first time it had made an investment of the IMP type, and that safeguards have been built in so that the SDA could get the money back if the factory did not materialise.

In fact, the SDA has made a good investment anyway, as the shares are now understood to be worth nearly three times more than it paid for them.

# The superminifloppy is destined for UK

by Keith Holder

FLOPPY disc drives which cram 3.3 Mbytes on to a standard high quality 5¼-inch disc will hit UK OEMs next month. The "superminifloppy" from California-based Drivetec will be available in the UK through Ambar Systems for around £480 in single units, dropping to £350 for bulk orders.

The drive can also operate as a lower-capacity industry standard, allowing users to read existing discs. In the high capacity mode, a 500 Kbit per second, 160 millisecond average access time is offered, made possible by some novel design features.

Ivo Adam, Drivetec's vice-president of marketing, said: "Systems integration people have been pushing for this product. It offers two to three times the capacity at a 40-50% premium, which makes it very cost effective."

This increased capacity will allow one drive to replace the Winchester disc with floppy disc back up at the low capacity end of the computer spectrum.

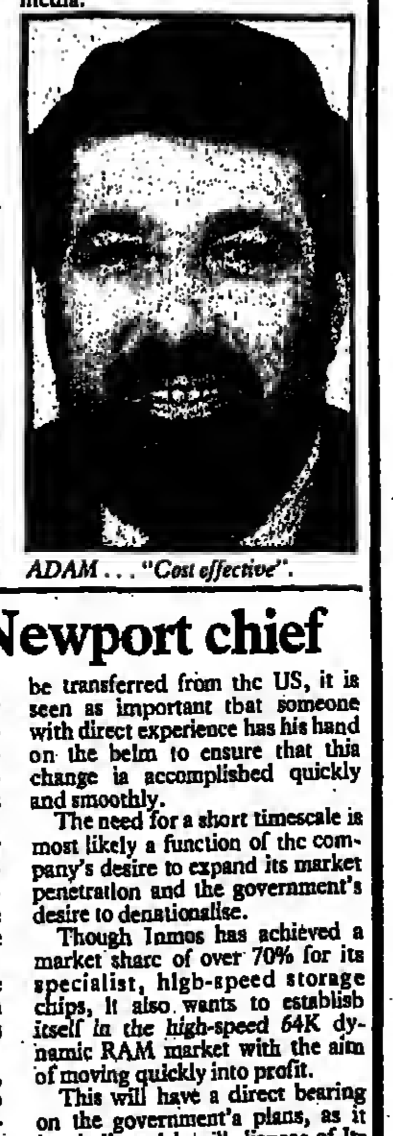
Winchesters have severe requirements for cleanliness, not needed with the floppy drive, and carry a significant cost disadvantage.

The combination of a high precision servo track following system, low wear gumball heads — with rounded corners — vertical media clamping and a patented backlash positioning system allows the drive to read and write 192 track per inch standard media discs with high reliability, says Adam.

The heads read servo information on the disc which, using an eight-bit 6805 microprocessor, compares the signal intensity between two tracks and adjusts the position of the heads until these are equal. Then the heads are centred.

This allows variations in discs caused by humidity and temperature to be compensated for.

The ceramic gumball heads, one fixed and the other attached to an arm, are rounded to reduce wear and match the elasticity of the media.



ADAM . . . "Cost effective".

# Inmos hires Newport chief

by Keith Holder

INMOS has appointed Emery Wisman as director of manufacturing at its Newport factory. Wisman was won over from Texas Instruments, where he was manufacturing manager.

This will be the first time for nearly two years that the State-owned company has had a manager with chip-making experience — a situation brought about by the departure of Rex Mears.

During the interim period, the Newport operation has been run by Mike Wright, the company's director of corporate services.

Though coming from the US, this will not be Wisman's first job in this country. He was UK managing director for Texas Instruments before Robb Wilmot, now managing director of ICL.

As the bulk of production is to be transferred from the US, it is seen as important that someone with direct experience has his hand on the helm to ensure that this change is accomplished quickly and smoothly.

The need for a short timescale is most likely a function of the company's desire to expand its market penetration and the government's desire to denationalise.

Though Inmos has achieved a market share of over 70% for its specialist, high-speed storage chips, it also wants to establish itself in the high-speed 64K dynamic RAM market with the aim of moving quickly into profit.

This will have a direct bearing on the government's plans, as it has indicated it will dispose of its shares as soon as that is commercially practicable.

Inmos declined to comment.

*Micro News is compiled by Robert Parry*

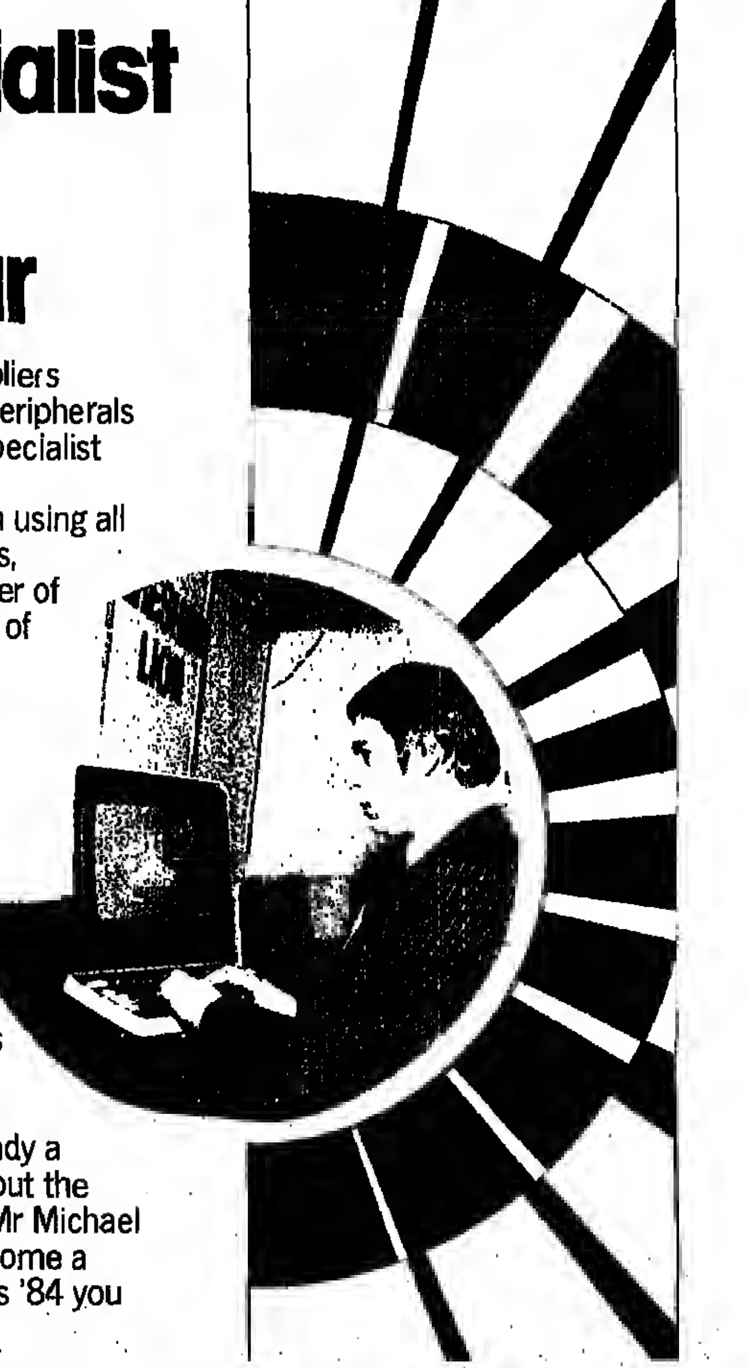

# The Key Specialist Event in the Computer Year

Sponsored jointly by the Peripherals Suppliers Association and 'Systems International', Peripherals '84 has justifiably been named the *only* specialist show for computer professionals.

Through a massive publicity campaign using all the key systems development publications, Peripherals '84 will attract a record number of visitors from purchasing/specifier sectors of this continually expanding market.

Attendance in 1983 was up 25 per cent on 1982. And 1984 is all set to be the biggest and most successful to date.

This is *the* buyer/specifier confrontation of the year. Don't miss it.



## How to Book Your Stand

This is the key specialist event in the Computer Year – ACT NOW – for further information telephone Ian Hardman, Sales Manager on 01-661-3022.

PSA members are eligible for a preferential stand rate. If you are not already a member and would like to know more about the association's aims and objectives phone Mr Michael Perry on 0908 668118. Provided you become a member before the opening of Peripherals '84 you can claim the special members rate.

PERIPHERALS 84 SUPPLIERS EXHIBITION

January 31 – February 2, 1984
Cunard Hotel, London

For more information return this coupon to Ian Hardman, Peripherals '84, Room L216, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS.

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Company

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هكذا من الأصل

COMPANY PROFILE

# Microdata manages to resist the lure of the micro

by Nuala Moran

ONE mini company in the UK is not going to sell a 16-bit micro in the face of falling markets for 16-bit minis. And this is quite a distinctive feature in a market where even the largest companies have recently been lured into micros for just this reason – for example, Data General, General Automation and Honeywell.

Microdata managing director Jerry Causley, explained why the company felt able to resist the pull of the micro. "Microdata's UK market is the The Times top 300 companies – large, sophisticated organisations. This type of user wants different things from the micro user.

"We are in the business of selling them large systems. These will embrace the PC in the sense of allowing them to hook on, but we don't need to go into the PC marketplace," he said.

The other trend that Microdata will not be following is the move towards selling through dealers. "As a manufacturer we will retain emphasis on end user selling and focus on the top end of the market," said Causley. "Other companies may vacillate between end user and distributor sales. My opinion is that selling through OEMs may bring quick profits, but it does not lead to strong relationships with the end user. If the distributor does a bad job it is the manufacturer that suffers."

Some 80% of Microdata's user base is lease/rental, and 20% outright sales which, Causley said, led to strong customer relations and provided financial strength.

Causley sees this policy of end user selling as still more important in the future. "People will want to control office automation closely. If we use OEMs then we won't be able to offer any guarantees because OEMs can back out."

But Microdata does not have a complete go-it-alone mentality. "We will work with software houses to cater for particular vertical markets, but we will still be the main contractor."

This philosophy seems to have borne fruit. The company, set up in 1970 as a US subsidiary, has always had a manufacturing base in the UK. "In fact," said Causley, "in many cases Microdata products have a higher UK content than many people claiming to be totally UK.

"Now we have a ten-year track record in the UK. Our hardware is guaranteed for 10 years, and some that old is still in use."

Earlier this year Microdata announced record profits of £6.8 million, up from £1.8 million. Sales jumped 55% to reach £35 million. And, according to Causley, prospects for 1983 look good with deliveries of the Reality Series 8000 and the Sequioa 32-bit super minicomputers up by over 50% and a 23% increase in orders to £13.5 million compared with the same quarter in 1982.

At the same time a £10 million investment in a research and development manufacturing plant which will create 300 jobs was announced. The building is due for completion next May.

Causley identified several strands to Microdata's success. He is keen on what he refers to as "the people side of manufacturing."

"People have stayed with Microdata from the very beginning. The original management team that set up the company is still intact. And we've never had a dispute," he said.

Microdata was one of the first companies to promote the idea of worker directors. There are two in the company who attend board meetings. One is elected every six months, and they serve for 12 months.

"It is not a case of bringing complaints from the shop floor. The worker directors could not veto a decision, but they do become involved in decision-making. There have been occasions when they have come along asking for a pay rise but have decided with the board that it wouldn't be realistic to get one," said Causley.

This is one of the factors which he sees as contributing to Microdata's stable workforce. Another is that continued expansion since the firm was established has meant opportunities were always available.

"We always plan future managers to come from within," said Causley.

Unlike other UK subsidiaries of US corporations, Microdata does R&D in the UK. Ten per cent of the profits each year are ploughed back into research.

"How do you survive against the might of an IBM or an ICL?" Causley posed the rhetorical question.

"The way is to look for niches where the giants aren't cost effective," he said.

Microdata has found niches in various vertical markets such as personnel, library systems and local authority applications.

Plenty of developments are in the pipeline, and new products on the way. Next year Supernatural is due to be launched. This is an artificial intelligence software which makes it possible to use a computer without special programming knowledge.

"This is the key to office automation," said Causley. "Anyone who hasn't got it won't be anywhere in that market. Artificial intelligence capability is the sign of whether or not a company will be viable in the next five years."

How does management contribute to a successful company like Microdata? "The most important asset to run a successful company is to be a good communicator. It's no good knowing where you are going if you don't tell people," said Causley.

"Of course I will have to work harder at communicating as Microdata grows. I have to make sure the message goes from top to bottom. It is failure to do this that is wrong with most large companies," he said.

CAUSLEY . . . Keen on "the people side of manufacturing".

PLATFORM

## Why micro growth is a dilemma

THE micro industry has had to grow up fast. Hardware products at the micro end of the market are on the verge of becoming obsolete by the time they are launched, so there is hardly time to establish a user base before a machine is superseded by a faster, more powerful and, sometimes, cheaper model.

This leaves software developers in a perpetual quandary. Applications take time to reach the market and work cannot start until the programmer has the target hardware. By the time he or she has the machine and starts to develop a range of products, the micro's successor (which may have a different operating system and range of languages) is moving off factory production lines.

How to catch up and stay in front: that is the question.

As the micro market has matured, the task of the software developer has altered dramatically. On the plus side, there is tremendous potential to sell high volumes of low-priced products in a rapidly expanding market. On the other side, as corporate buyers start to enter the market, customer technical knowledge and expectations are far higher than they used to be, so the quality of software has had to be raised accordingly. This means higher development costs which, to be viable, have to be recouped by selling to the widest possible range of customers.

If the nature of the customer has changed, so has the degree of dependence likely to be placed on a computer system. Many such buyers will rely on their systems for years to come: a small business cannot afford the disruption of shifting its accounts to a new system every few years, and will probably want to be able to upgrade and build enhancements on to the original software rather than change altogether.

Not only are developers expected to have learnt by their own and other micro software houses' mistakes in the early days; they are also facing corporate buyers who can draw on the first-hand experience of in-house mainframe and mini DP departments.

The logical source to provide this capability is the original software developer and it is vitally important that the right development tools have been used initially so that this requirement can be effectively satisfied in the future. The selection of development tools now has never been more critical.

It is becoming essential that, if hardware manufacturers choose to build for obsolescence, software provides the cohesion and portability needed to carry users up a consistent growth path, regardless of the hardware.

Building up resources to allow this commitment for the future requires careful planning by the software house. When choosing a target micro, operating system, language compilers and productivity tools – and, of course, the suppliers of each – the software developer must ask whether the products will be supported and enhanced for as long as they are likely to be needed, and beyond.

*Paul Bailey*

*Paul Bailey is director of European operations, Digital Research.*

DOWNTIME

## Sweet and reasonable

PERHAPS 1983 will go down in the political annals as the year of moderation. Margaret Thatcher returned to Number 10. And then the unthinkable: trade unionists are to talk to Norman Tebbit, although whether the much-slandered Minister will reply remains to be seen.

In the computer industry too, moderation is in the air. When last year IBM announced its price rises, users howled with anger and conducted what was virtually a slanging match with IBM in public.

This year there are murmurs of malcontent about a 10% increase in the cost of maintenance agreements on some machines. But there will be no public rift between IBM and members of the IBM Computer Users Association.

And in private users concede that IBM has judged things nicely, to use the word in its original sense. Few users are saying they will be persuaded by the rises to go for the plug-compatible alternatives.

Which cannot bode well for Amdahl, National Advanced Systems and others.

"Don't call our answering machine Mr Brewster. We'll call your answering machine".

## Shome mishtake, m'lud

IT has not been Chad's practice to acknowledge the existence of any other organs that touch on our august industry, except when absolutely necessary – for instance, when they get sued – but there are special occasions which have an intrinsic news value and therefore cannot be ignored.

It appears I have been quoted by E. Strobes, pp Lord Gnome, though I am shure there must be shome mishtake. I could never be described as one of the great bores of today, not even by the notoriously inaccurate *Private Eye*.

I would not dream of hanging a dongle off my RS232, so Lord Gnome can expect to hear from my solicitors. Having described the Sinclair micro as an abscess, he can probably expect to hear from Clive's solicitor too. Pipi pipi (contd p94).

## Spare a thought for the operators

WHEN choosing a company name, it is as well to spare a thought for the British Telecom operators who will have to look it up in a directory. This thought clearly eluded the BBC's Brian Redhead when seeking a name under which to market his video, The Micro Computer.

He chose Double Tee Productions, a name which has caused many of our readers to curse as a result of mis-spelling by staff of BT's directory enquiries.

"We received calls from some readers who had spent ages on the phone to director enquiries and who were beginning to think it was a hoax," says Trevor Taylor, producer of the video.

## Matter of life and death

AN advertisement for a life assurance policy claimed that people in the UK could expect to die at 40 if they were born in the early days of Queen Victoria's reign. That is a statistic, a piece of useless information perhaps, but damnably correct.

However the advertisement went on to claim that men 140 years ago were less likely to live to see their grandchildren. Lie, damned lie or statistic? A damned lie I am afraid.

The fact is that the poor life expectancy was entirely down to infant deaths.

## Not quite teacher's Pet

MY four-year-old daughter is already something of an addict to my little Pet, and one positive result is that she can spell as well as many a grown-up.

Not that that is a great recommendation – but not bad for a four-year-old.

Or so I thought until I received an opprobrious letter from her schoolteacher demanding to know why it was she could only read words that were written in capital, or upper case, letters.

*Chad*

10 YEARS AGO

FROM COMPUTER WEEKLY OF SEPTEMBER 13, 1973: Control Data Corp and NCR announced the joint formation of an advanced systems laboratory "to conduct joint architectural design of future central processing units" . . . The 24th Sicob show in Paris attracted 579 exhibitors from 24 different countries . . . Digital Equipment Corp announced the first of a series of mini systems costing £10,800.

ComputerWeekly

Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS

Thursday, September 15, 1983

# Telecomms policy confuses users

SIR Michael Edwardes is not a man given to panic. He could be excused, however, if a twitch or two were to mar his urbane appearance.

Edwardes, chairman of Mercury Communications Ltd, is in desperate need of customers for his rival to the British Telecom network. When he spoke this week at the annual Telecommunications Managers Association Conference in Brighton, he was given an effusive welcome by the chairman of the TMA. Edwardes said thank you for the compliment, but I am here for the business.

The delegates to the TMA conference gave Edwardes an enthusiastic welcome. They were clearly delighted by the response BT has made to the more competitive telecommunications environment, and they were clearly anxious that Mercury should succeed in its efforts to provide an alternative service.

But there was a marked reluctance by many of the telecommunications managers to put their own companies on the line for fear of getting embroiled in the arguments of BT's unions against the government sale of BT to the private sector.

Edwardes lamented that the interconnection of Mercury to the BT network, and the sale of BT, are confused in many people's minds. He did not say, but he may have been implying, that the government was once more getting hung up on its own doctrinaire approach towards selling off its assets.

Making the telecommunications market more liberal, and selling BT to the private sector, are two very separate issues, he suggests, and by tying them into the package the whole process is made subject to delay and possible failure.

The UK government has taken a lead in telecommunications policy which it expects the rest of the world to follow. But there is the danger that it has taken too large a bite in its attempt to let loose free market forces.

There is still a great deal of confusion about how the policy will work in practice, and users are not surprisingly taking a wait and see attitude.

Edwardes promises that Mercury will establish itself as a major force in the telecommunications market. That is open to debate, but if the government wants the enterprise to succeed it should get in closer touch with the user community. A better mousetrap needs a convinced customer to sell.

# Seminar of hot air

THE time of men like ICL's Wilmot, Ferranti's Alun Jones and Cable and Wireless's Sharp, does not, to put it mildly, come cheap. It is to be wondered whether they, and 250 other top industrialists, politicians, professors and bankers, feel that they spent Monday wisely.

Lancaster House probably drew together for the seminar on science, technology and industry a group of the richest and most successful people ever to meet under one roof in Britain. It is a pity they spent so much of the time recounting their own achievements.

If things were really that rosy there was no need for them to have come. There was a strange sense of unreality about it all, reinforced by the iteration of so many platitudes. There was also a sad dearth of definite proposals.

It was very late in the day when a representative of a minor venture capital house, Alan Patricof Associates, pointed the scale of the problem with the remark that one American company – IBM – spent more on research than the whole UK effort.

It was later still before the consensus on our academic brilliance was broken by Met Office director Sir John Mason, who feared we were in fact losing our sharp competitive edge in science.

Perhaps more of the real business of the day was being conducted over the lunch tables in the marquee.

Our first science-graduate PM called it a great success and promised a repeat. Next time she may not be able to say no-one declined to come.

## 1984 and all that . . .

THIS week's example of the strange things people say about computers was sent in by Trevor Warwick of Bromley, Kent, who wins £5.

New Order are using an Emulator programmable synth, which uses a 'floppy' disc, which is a computer programme on a flat disc.

*New Musical Express*



LETTERS

## The things they say . . .

IS your 1984 and all that . . . quote from *She* (*Computer Weekly*, September 1) an example of the strange things people say about computers, or is the choice of it an example of the strange attitude of computing people to the things people say about computers?

OK, so there are at least two sorts of loose expression in the extract; but given the cynical or at least thoughtless way in which all too easily computer systems may be designed and used, any attempt to increase the awareness of the readers of *She* or any other popular magazine ought to be encouraged rather than patronised.

ALAN WEYMAN
Bourne End
Bucks.

## BR on the wrong lines

IN your column 1984 and all that . . . (*Computer Weekly*, August 25) regarding the Inter-City traveller who wished to reserve a seat on the left-hand side of the carriage and was told that the computer cannot recognise this, I have an observation to report.

My wife and I travelled recently on the same East coast route and selected a table for two in the restaurant car. There were reserved seats, each reservation being for one person, at tables for four persons on four different tables. All the tables for two were unreserved. The single reserved seats were duly occupied and in due course groups of people wishing to sit together declined to dine as they could not sit together.

At restaurant car rates of about £10 per head, British Rail lost a significant amount of revenue because the left-hand does not know what the right hand is doing.

CHRISTOPHER R. JACKSON
Group managing director
Christal Rapid Transport
Reading.

## Let people do this work

IN Re-think on Jobs (*Computer Weekly*, September 1) you seem to fall into the trap of assuming "if not job then leisure." This leaves out two major categories of work: the non-cash economy, which is quite different from the illicit part of the cash economy, and work that is needed but not being done.

Defining work as an activity done for its output, distinguishes it from hobbies which are done for their own sake, and free time with no output. Jobs are work that is done in the cash economy (employment and self-employment).

Then there is work done in the non-cash economy: domestic, do it yourself, community and voluntary work.

The third major category is work that is needed but is not being done. It is mainly caring for young, ill, and frail, and repair, the insulation, etc, of housing. Ironically there is more of it as yet than there are people available for work.

The need is an economic and social system that will let the people available do this work, whether as jobs in the cash economy, or outside the cash economy.

More leisure may come in the next century, but we should not take leisure now at the expense of the weak, nor of future generations.

HENRY COX
Alsager
Stoke-on-Trent.

## A matter of opinion

IN the article by Paul Walton, "Company profile on Hewlett-Packard" (*Computer Weekly*, August 25) several comments were attributed to Peter Guymer of Systemsolve. Many of these comments were Peter's own opinions and not representative of the general view at Systemsolve.

No manufacturer could ever be in a position where at any given time all elements of his hardware or software offerings were perfect. We undertake a considerable amount of turnkey business involving Hewlett-Packard systems and feel that generally speaking their products represent excellent value.

J. E. P. STANLEY
Managing director
Systemsolve.

## Journalistic licence?

THE article on laser printing (*Computer Weekly*, September 1), carried an illustration with the caption "For the monk, 21,000 minutes per line". Surely this is unnecessary journalistic licence? Fifteen days, or just over 14½, to do one line sounds far too long, even for that laborious process.

KENNETH E. LOCK
CCTA
Norwich.

*The Editor welcomes letters commenting on subjects published in* Computer Weekly, *or on original topics. All letters must be accompanied by the writer's name and address, not necessarily for publication.*

## Tops trainees 'half the cost of growing our own'

I READ with interest your article (*Computer Weekly*, July 28) on plans to revamp Tops computer courses. For a number of years I was responsible for programmer training and career developments in a management services organisation where we successfully "grew our own" programmers and analysts. More recently, I was instrumental in setting up a Tops programming course for a software house.

May I offer a few personal reflections on the Tops scheme in general and programming courses in particular?

I suspect that the most important obstacle to the employment of Tops "graduates" is the attitude of potential employers. Too many organisations, including the Civil Service I believe, are not prepared to take trainee programmers and analysts, and those that do prefer to train their own.

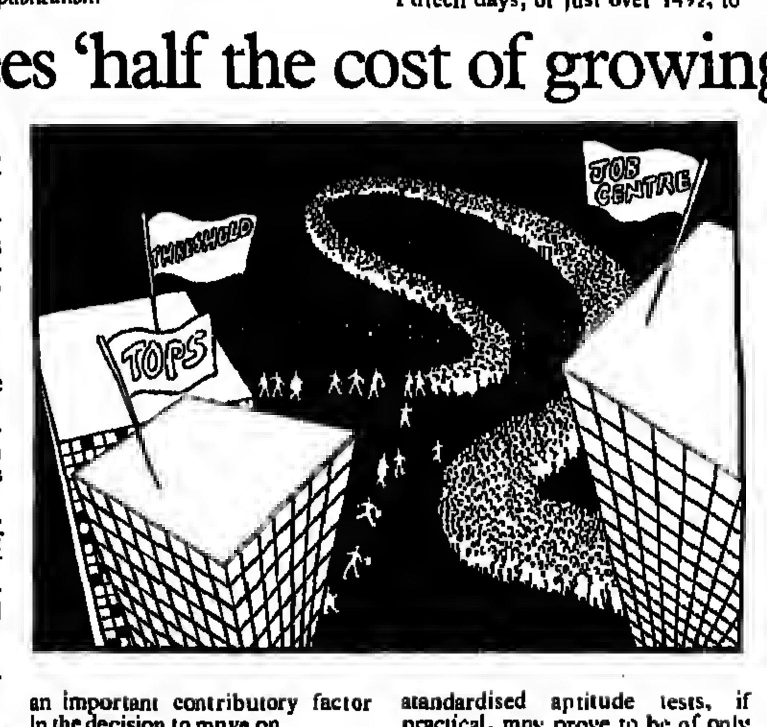
For too long there has been a Catch-22 situation whereby vacancies, with rare exceptions, call for a minimum of two years' experience. Not surprisingly, those organisations brave enough to advertise vacancies that provide this initial experience are deluged with replies.

We used to ask for at least two A levels and impose an upper age limit to reduce the flood to manageable levels. Even so, we used to receive about 150 replies.

Proper training is expensive, though using contractors to make up for shortfalls in permanent staff, or inflated salaries, are more so. We calculated that it cost the equivalent of a trainee's salary for a year simply to complete a thorough basic training lasting three months. But if a trainee stays only two years on average, as was our experience, it becomes difficult to justify such costs.

The recession may have encouraged programmers to remain longer with an individual employer. However, it is likely to have reduced employers' willingness to undertake training also, short-sighted though this may be in terms of investment in essential skills for the future. Not infrequently, training starts low on the list of management priorities, and is relegated even lower in times of crisis.

High employee mobility does not encourage this investment, but there is evidence indicating that turnover rates frequently fall when staff receive proper training, and conversely, lack of training can be an important contributory factor in the decision to move on.




Tops trainees from properly run courses offer advantages to the employer. The cost and duration of training necessary to become fully productive are reduced, though not eliminated. Each trainee will need to be integrated into the organisation with its particular policies, methods and standards.

Some technical training may also be necessary. When we consider taking Tops-training programmers, we estimated the cost would be about half that of "growing our own".

Had we recruited Tops trainees, we would have insisted on the same entry procedures as applied to entrants without formal training. The reasons for doing this cast a critical light on some of the recommendations and expectations.

First, the combination of aptitude test battery, recommended by George Penney of the NCC, and interviews, had a proven track record within our organisation. From investigations we had carried out in the late 1970s, we were unimpressed by the selection procedures of certain organisations running Tops courses. I suggest that payment on a per capita basis introduced by the MSC in 1981 potentially worsened the situation as it does not encourage careful selection of students.

Second, our particular DP requirements led us to exclude both low and high achievers on the aptitude test battery. (Incidentally, we recruited computer science graduates infrequently for the same reasons). Thus the plan to use standardised aptitude tests, if practical, may prove to be of only limited benefit to potential employers, setting only a lower confidence limit. I would expect computer manufacturers and some software houses to have different needs from those organisations seeking commercial applications programmers, for instance.

Third, we would have started Tops-trained programmers on the same grade as our "own grown" ones, but anticipated that initial promotion, on merit, would be achieved more quickly. However, we were aware that some Tops trainees had expectations which we could not reconcile with their initial usefulness. As far as we were concerned, all they had achieved was certain essential basic training. I impressed this on my own Tops students, and encouraged other instructors to do the same.

I fully support the move to minimise any problems in Tops trainee selection. Success or failure here profoundly affects the overall results of the course. Published guidance on entry requirements and procedures for assessing applicants will assist course organisers as well as improving employers' respect for the Tops scheme.

However, Hugh Sharp, MSC's head of computer training, is deluding himself and others if he believes the 10-12% dropout rate can be eliminated. It cannot without poor administration; nor should this rate be considered unreasonable.

Aptitude tests are purely predictive and the testing suffers the same problems as any other examination. Likewise, interviews inevitably contain a subjective element however carefully carried out. Consequently, perfect selection is impossible, so no dropouts or a very low rate is likely to indicate poor instructor assessment of trainees.

A small reduction in the present rate may be possible but probably at the price of excluding too many who, if given the opportunity, would become competent computer professionals but perform poorly in the selection procedures.

I presume the main argument in favour of some recognised certificate is that it would serve to boost employers' confidence. It should not become a poor substitute for their having sound selection procedures. Also it should demonstrate more relevance to an applicant's suitability than does the frequently encountered requirement for two A-levels.

Surely a well-presented portfolio of the student's work on the course gives as good an indication of an applicant's competence, and is available at any time? A certificate, particularly examination-based, is unlikely to be awarded before course completion, by which time many students will have already applied for jobs.

I support the principle of a common core of modules. Whether this should be taken as far as a single programming course is another matter. My own work for both organisations drew on the NCC Entry-level Programming Course, but so heavily revised and updated as to be unrecognisable. Many of the changes were necessary to meet specific requirements. A single course would have posed too many constraints, both on the organisers and instructors, and would have been incompatible with the facilities available.

Tops courses do have a useful role in training computing professionals. However, the main thrust of their efforts should be in providing personnel for small organisations which cannot justify the resources to undertake the proper training of new entrant staff. Such organisations are likely to be using small mainframes or minicomputers, mainly.

Tops should not be principally a source of cheaply trained labour for organisations with large data processing departments which ought to have internally-resourced entry level training programmes for computing professionals.

M. FARLIE
Gandalf Informatics
London.

# Graphics aid the war on cancer

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The camp was just as well equipped as its commercial neighbours, with micros loaned by Atari, and other odd bits of equipment, such as a robot arm programmed by a 13-year-old boy.

There was also some voice recognition equipment, useful for deaf children.

Nearly all the children were girls. Just chance, said Molly Lowell, co-founder of Community Computer Camps, an advisory service set up by Inter-Action Trust.

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See page 21 for solution.



# GRAPHICS

# Why a good picture is worth more than a thousand words

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IF product announcements from computer manufacturers provide any indication, the ability to handle graphics is the current number one priority of the information processing industry. Working, perhaps, on the principle that a good picture is worth a thousand words, system designers are finding ways of integrating illustrations with data and text on computers.

Interest in graphics is not simply a marketing ploy on the part of the hardware suppliers to gain an edge over competition — there is a more technical justification behind recent developments. It is all a question of communication: psychological testing suggests that data presented in the form of graphs or piecharts can be absorbed more easily than as serried ranks of rows and columns.

Systems able to mould raw statistical information into a graphic display are not a new development. Like so many developments with applications in peace time, they evolve to meet a specific military requirement. Over in the US during the early 1950s, the Semi-Automatic Ground Environment (SAGE) air defence system employed a graphics quality VDU to mark the location of aircraft.

A graphics capability which could be applied to support business and technical software did not emerge for another decade, however. The Sketchpad project, financed by the US government at the Lincoln labs of the Massachusetts Institute of Technology developed the concepts of data structure and software from which modern graphics systems have evolved.

Early graphics systems were inherently expensive: they required the largest — and most expensive — computers on the market at the time. The user base for the pioneering systems was therefore confined to government institutions, the major universities and industry. Applications of graphics technology had to justify the cost of the hardware and the development of software. Engineering design with its implications for cost-saving, was therefore a natural candidate for computerisation through graphics.

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Three-dimensional representation has been the major development for the engineering industry during the past four years; the software handling the changes in scale and perspective that are involved in presenting a 3-D concept through the medium of a 2-D screen.

By the mid 1960s, the cost of graphics system components had fallen to the point where computer manufacturers could risk developing systems for a more broadly based market.

Hewlett-Packard, for example, recognised the potential for a graphics system in the medical field; launching its first medical display in 1966. The forerunner of medical displays used as standard diagnostic tools today, the system found an immediate application in foetal monitoring. A high resolution radar display marked the company's entry into large screen display technology, providing the experience to design a commercial graphics terminal for data processing by 1978.

Manufacturers have taken up the challenge of computer graphics: many with applications that span the business and technical markets. Digital Equipment has recently launched its VAXstation system as a workstation to its 32-bit VAX super minis. Apart from emulating Tektronix and DEC's own VT100 terminals, the VAXstation allows engineering graphics programs to be run simultaneously with text and data processing routines in virtual memory. Windows through the high resolution screen select the working areas to be viewed, and these are pasted together on the display.

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At the level of a standalone device, the ICL Perq launched two years ago in the UK has found applications among both technical and commercial users. A similar market profile has been planned for the Apple Lisa; a product whose graphics potential perhaps exceeds the resources of the applications software now available.

References to computer graphics imply that a single technology underlies the display of illustrations on a VDU, or on the subsequent output to a printer. In practice, three parallel strands of development have produced displays which now satisfy the complete range of graphics requirements.

Storage tube systems retain an image without the need to refresh the display. Once a phosphor cell on the inner surface of the vacuum tube has been struck by an electron, it is activated; the intensity being maintained by a lower energy flood of electronics.

The writing beam draws what appears to be a continuous line — in practice, a succession of short vectors — between pairs of points on the screen. The effect of a solid line is achieved by focusing the light beam to a diameter marginally greater than the spacing between the phosphor cells.

Terminals incorporating storage tubes are characterised by the sharp edges to the image and the absence of flicker on the display. A complete display can be re-written in less than half a second, making storage systems suitable for computer-aided design and drafting, where changes to a design can be made interactively. The ability to fill in areas of the display between defined boundaries extends the application from engineering into cartography.

A refreshed image can be superimposed on an image being stored on the screen, using the write-through facility. The intensity of the beam is maintained at a level low enough to avoid tripping the phosphor cells and switching on the flood beam. In this mode, it is possible to construct complex graphics modules which can be edited and re-positioned before storage.

The raster-scan technology used by television displays has been taken up by computer graphics designers as the second of the methods for creating an image. A modulated electron beam is scanned uniformly across the surface of the CRT at 50 or 60 hertz — a rate high enough to prevent the eye noticing the refresh.

Raster scan technology has only recently become a viable display medium for the smaller systems market, given the cost of a screen required to support an acceptable standard of colour graphics. The screen is built up from minute picture elements (pixels), each of which is seen as a single point addressable by the computer when characters and graphic systems are being formed.

**Graphics plotter development owes much to Calcomp, with its drum plotters, and the dry silver copier process of Tektronix**

The number of pixels which are required to form a character determines the screen resolution. At a level of 512 by 512 pixels, more than a quarter of a million cells have to be identified uniquely — corresponding to about 32 Kbytes on an eight-bit computer.

Colour display monitors work in four planes, each requiring a similar amount of memory. The total memory consumed by such a screen — regarded only as a medium resolution device — is therefore 128 Kbytes. Double the resolution to 1,024 pixels in each direction, and the screen memory required is increased by a factor of four to half a megabyte.

Vector-refresh tubes are the third category. Operating in many ways like a storage tube in write-through mode, these systems do not hold an image on the phosphor. A typical graphics system based on this technology comprises a memory for the display, a display controller and a CRT.

The voltages required to control the tube are identified from a display list scanned by the display controller. The refresh rate required to avoid flicker is sufficiently slow for the image on the screen to be modified by the host computer. This ability to react rapidly to instructions input by an operator direct from the computer keyboard provides a suitable medium for CAD.

Graphics plotter development owes much to Calcomp, with its drum plotters, and the dry silver copier process of Tektronix. The technologies involved in generating an output correspond to the vector and raster methods of forming a screen image.

With a vector system, the output is developed by a pen moving from point to point across the writing surface. While the speed of such a device is usually high enough for business graphics applications, any reduction in throughput is more than compensated by the quality of the ima

Raster scan output device perhaps more appropriate multi-colour or shaded chara the resolution is lower than t vector control. Images from t ter plotter are turned into copy in one of three ways. A striking through one or m coloured ribbons is analogous matrix printer.

In practice, the current ge tion of matrix printers — in w the image is formed by succe passes of a comb of needles produce an acceptable standa graphics, merged with text data into a single document. V mal printers set an image whe printing head comes into co with heat sensitive paper, electrostatic printing is mo on a photocopier.

Computer graphics seem benefit from a printing techn which is only now emer Laser output devices can duce high resolution images f display tube through a mn photocopier, or by scanning to a photographic film — a nology pioneered in the phot setting industry.

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WORKPLACE

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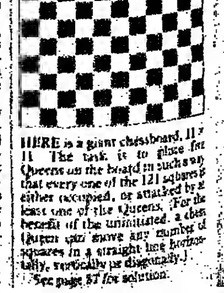

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By the mid 1960s, the cost of graphics system components had fallen to the point where computer manufacturers could risk developing systems for a more broadly based market.

Hewlett-Packard, for example, recognised the potential for a graphics system in the medical field; launching its first medical display in 1966. The forerunner of medical displays used as standard diagnostic tools today, the system found an immediate application in foetal monitoring. A high resolution radar display marked the company's entry into large screen display technology, providing the experience to design a commercial graphics terminal for data processing by 1978.

Manufacturers have taken up the challenge of computer graphics; many with applications that span the business and technical markets. Digital Equipment has recently launched its VAXstation system as a workstation to its 32-bit VAX supet minis. Apart from emulating Tektronix and DEC's own VT100 terminals, the VAXstation allows engineering graphics programs to be run simultaneously with text and data processing routines in virtual memory. Windows through the high resolution screen select the working areas to be viewed, and these are pasted together on the display.

**Manufacturers have taken up the challenge of computer graphics; many with applications that span the business and technical markets**

At the level of a standalone device, the ICL Perq launched two years ago in the UK has found applications among both technical and commercial users. A similar market profile has been planned for the Apple Lisa; a product whose graphics potential perhaps exceeds the resources of the applications software now available.

References to computer graphics imply that a single technology underlies the display of illustrations on a VDU, or on the subsequent output to a printer. In practice, three parallel strands of development have produced displays which now satisfy the complete range of graphics requirements.

Storage tube systems retain an image without the need to refresh the display. Once a phosphor cell on the inner surface of the vacuum tube has been struck by an electron, it is activated; the intensity being maintained by a lower energy flood of electronics.

The writing beam draws what appears to be a continuous line – in practice, a succession of short vectors – between pairs of points on the screen. The effect of a solid line is achieved by focusing the light beam to a diameter marginally greater than the spacing between the phosphor cells.

Terminals incorporating storage tubes are characterised by the sharp edges to the image and the absence of flicker on the display. A complete display can be re-written in less than half a second, making storage systems suitable for computer-aided design and drafting, where changes to a design can be made interactively. The ability to fill in areas of the display between defined boundaries extends the application from engineering into cartography.

A refreshed image can be superimposed on an image being stored on the screen, using the write-through facility. The intensity of the beam is maintained at a level low enough to avoid tripping the phosphor cells and switching on the flood beam. In this mode, it is possible to construct complex graphics modules which can be edited and re-positioned before storage.

The raster-scan technology used by television displays has been taken up by computer graphics designers as the second of the methods for creating an image. A modulated electron beam is scanned uniformly across the surface of the CRT at 50 or 60 hertz – a rate high enough to prevent the eye noticing the refresh.

Raster scan technology has only recently become a viable display medium for the smaller systems market, given the cost of a screen required to support an acceptable standard of colour graphics. The screen is built up from minute picture elements (pixels), each of which is seen as a single point addressable by the computer when characters and graphic systems are being formed.

**Graphics plotter development owes much to Calcomp, with its drum plotters, and the dry silver copier process of Tektronix**

The number of pixels which are required to form a character determines the screen resolution. At a level of 512 by 512 pixels, more than a quarter of a million cells have to be identified uniquely – corresponding to about 32 Kbytes on an eight-bit computer.

Colour display monitors work in four planes, each requiring a similar amount of memory. The total memory consumed by such a screen – regarded only as a medium resolution device – is therefore 128 Kbytes. Double the resolution to 1,024 pixels in each direction, and the screen memory required is increased by a factor of four to half a megabyte.

Vector-refresh tubes are the third category. Operating in many ways like a storage tube in write-through mode, these systems do not hold an image on the phosphor. A typical graphics system based on this technology comprises a memory for the display, a display controller and a CRT.

The voltages required to control the tube are identified from a display list scanned by the display controller. The refresh rate required to avoid flicker is sufficiently slow for the image on the screen to be modified by the host computer. This ability to react rapidly to instructions input by an operator direct from the computer keyboard provides a suitable medium for CAD.

Graphics plotter development owes much to Calcomp, with its drum plotters, and the dry silver copier process of Tektronix. The technologies involved in generating an output correspond to the vector and raster methods of forming a screen image.

With a vector system, the output is developed by a pen moving from point to point across the writing surface. While the speed of such a device is usually high enough for business graphics applications, any reduction in throughput is more than compensated by the quality of the image.

Raster scan output devices are perhaps more appropriate for multi-colour or shaded charts, but the resolution is lower than under vector control. Images from a raster plotter are turned into hard copy in one of three ways. A head striking through one or more coloured ribbons is analogous to a matrix printer.

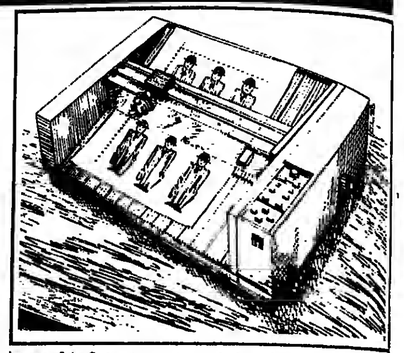
In practice, the current generation of matrix printers – in which the image is formed by successive passes of a comb of needles – can produce an acceptable standard of graphics, merged with text and data into a single document. Thermal printers set an image when the printing head comes into contact with heat sensitive paper, while electrostatic printing is modelled on a photocopier.

Computer graphics seem set to benefit from a printing technology which is only now emerging. Laster output devices can reproduce high resolution images from a display tube through a modified photocopier, or by scanning directly to a photographic film – a technology pioneered in the phototypesetting industry.

With 600 lines per inch resolution on a laser copier costing around £12,000, computer graphics will continue to spread into areas of business and industry which would have been inconceivable to the US Defence Department just a generation ago.

# Conjuring tricks that are for real

## David Casey says there is more to business graphics than meets the eye



USING graphics software to generate charts and diagrams can be discounted by the sceptics as sleight of hand; inspressing more by its effect than any additional information that the presentation could inpart.

Figures entered in a spreadsheet, for example, are transformed effortlessly into a piechart; the sectors of a perfectly formed circle calculated without operator intervention. And with only a few keystrokes more, the same source data can be re-displayed as a scatter diagram or a best-fit curve polynomial curve.

The ease with which these feats can be performed on the current generation of computers supporting a graphics facility conceals the investment in development that underlies both software and hardware components of such a system.

It is significant that there is no single approach to business graphics: designers have sought to tap the potential of existing DP markets as much as they have been stimulating new computer users to take a graphics capability on board along with their text and data processing.

Contrasting philosophies of graphics for the commercial user are typified by three systems currently in the UK market. Micro Plot, from Hytech Consultants in Buckinghamshire, is targeted at existing microcomputer users wanting to extend the range of output facilities available from their machines.

Designed as component of an "integrated business system", LisaGraph and LisaDraw are intended to provide a more meaningful interpretation of data elsewhere in an Apple Lisa, while the Executichart system from Comshare has a unique role in business graphics production.

Running on a range of eight-bit and 16-bit computers which lack a high resolution screen, the Micro Plot program generates a graphics quality image direct to a suitable output device. When it was launched 15 months ago the graphics package was confined to a handful of eight-bit processors under CP/M: Superbrain and Research Machines 380Z were among the first implementations. Hytech has been adapting Microplot for the more popular 16-bit micros, with the Sirius and IBM PC as priorities.

Micro Plot emerged as a spin-off from Hytech Consultants' earlier graphics product Micro Designer, a two dimensional engineering drawing system launched in March 1982. The company identified a demand for the components of that package that were immediately relevant to business users and decided to market them as a separate suite of programs.

Recognising that many microcomputer installations run on a minimal budget, Hytech developed Micro Plot to drive either a pen plotter or the more economical matrix printer. As awareness of computer graphics in business graphics grows, demand will increase for linking a package like Micro Plot to the dot matrix printers purchased with the micro.

The quality of the output to a dot matrix printer must be clear enough to warrant translating data into graphical form: there must be a sufficient number of ways, for example, to differentiate between the types of data being represented in a graph or piechart.

Microplot can cope with the limited facilities available on a dot matrix machine. There are seven ways of presenting a line – combining dots and dashes – and 10 possibilities for presenting blocks on a histogram. If the output is to a pen plotter rather than an impact device, the combinations of colours and graphic elements extend the scope of the package by an order of magnitude.

Piecharts are a potential weakness in the current release of Microplot, however, as the operator's choice is restricted to two types of shading. Without access to a multi-colour pen plotter, a chart would lack clarity and lose much of the impact that can be achieved through graphics.

Irrespective of the form of the output from Micro Plot, only a single source of data is required. Selecting the form of output calls up the routines to interact with a named data file in the system. A series of prompts appears on the screen to help the user set up parameters for the figure, which can include text for headings, axes and legends.

Scales for Micro Plot diagrams are calculated automatically by the system, taking an A4 sheet as default, but adjustments can be made for other paper sizes, however. The output file assembled by Micro Plot can be edited to change any of the graphics features – the size of lettering or the colour of the pen, for example. In the absence of any other instruction to a plotter, Micro Plot will select each pen in turn; the first producing the outlines; the second the lettering, right through the range.

Micro Plot provides a "passive" graphics capability when used to generate charts and graphs from pre-calculated data. The same package can handle more complex mathematical routines when called upon to fit smooth curves to input data. The package will select the best fit from a straight line up to a fifth order ($X^5$) polynomial curve, listing the coefficients for each power of the variable.

**It will take perhaps another decade of exposure before the last traces of scepticism disappear**

Many of the facilities proved by Micro Plot would be of interest to Apple customers investing in Lisa, a system which has received a mixed reception from the business systems market place.

Forming part of the suite of integrated applications, LisaGraph cannot be considered in isolation from the rest of the system's software. Figures from the spreadsheet in the LisaCalc module, for example, can be transformed directly into graphics output: diagrams created in the graph application can be embellished with the use of LisaDraw. And for document production, a graph could be incorporated within a body of text.

Where an integrated system has an advantage over "single medium" computers is in being able to show data, and the graph that it has generated, side by side. With the multiple window facility on Lisa, several documents – and therefore graphics figures – can be displayed at the same time.

Graph scales are calculated automatically, from the range of the data being handled, and the paper size. Data values in the first column of a table are regarded as the X-axis variables – time periods or categories, for example. The vertical axis values are taken from the remaining columns of data: eight different sets of Y values can be plotted on the same graph.

Output from the present version of Lisa is limited to a high resolution dot matrix printer or a daisy wheel device.

With its roots firmly in computer bureau services, Comshare identified a very different graphics market from either Hytech or Apple. The objective of its Executchart system was to produce a high standard of graphics for display from data generated on the bureau's mainframe computers. What has evolved is a dedicated eight-bit microcomputer which takes in fully prepared data and reproduces it in a wide variety of formats and styles through a 512 by 512 pixel screen.

Unlike Micro Plot and Lisa, Executchart does not have inherent data processing power: there is no facility to estimate the formula for a curve, for example, or calculate a trend in a sequence of data. What the system lacks in its "number-crunching" abilities is more than compensated, however, by the quality of data presentation and the ease of use for an operator.

The Comshare system today is designed specifically for the commercial market with the presumption that the user will have scant knowledge of computer systems. Able to operate in six different modes, the standalone terminal is supplied with a library of charts as an aid to designing meaningful displays. It is totally menu driven; Executchart providing one of the first mouse cursors in the industry to select from these display options.

Although the Executchart can be purchased, Comshare operates a bureau service based on the system where a user's throughput could not justify the £25,000 capital cost. Overhead slides and projector transparencies are produced photographically from the video display, while hard copy is taken primarily through a high resolution colour impact printer, or an inkjet device. The company's American offices provide a third device which produces an even higher standard of hard copy, a Xerox colour laser printer.

Comshare, Apple and Hytech Consultants between them illustrate the breadth of technology available to the business graphics user.

It will take perhaps another decade of exposure to these display techniques for the last traces of scepticism to disappear: provided that care is taken over the method of presentation, graphics add to – rather than subtract from – the quality of information.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# Graphics' rise mushrooms as users watch their data

## Margaret Park surveys the market statistics for workstations and terminals – the story behind the pictures

THE graphics display market is one of the youngest and one of the fastest growing sectors of the computer industry.

Now the use of graphics as a tool in numerous applications is being appreciated by more than just the computer-aided design and computer-aided manufacturing (CAD/CAM) camps.

Graphics displays offer another medium for juggling data and the market expected to see the most dramatic growth is the business user sector where graphics can be used as an effective tool to display information.

In 1982, 27,500 graphics display units were shipped in Western Europe either direct to end users or to OEMs who use them to build complete systems and add value by offering software for particular applications.

Those 27,500 display units were divided into graphics terminals, which account for 60% of the total, workstations and lastly, alphanumeric terminals used for graphics applications. Altogether this hardware was worth $346 million.

The big names in graphics display terminals are Tektronix, which dominates the graphics terminal market; Hewlett-Packard, which currently has the graphics workstation market pretty well to itself, and, of course, IBM, which has got its foot in the graphics door by laying claim to the market for alphanumeric terminals.

In the UK, two names are prominent – Sigma Electronics Systems which offers a wide range of raster monochrome terminals and Westward Micro Systems which relies on the UK for 70% of its business and deals in Tektronix-compatible kit as well as the usual raster monochrome and colour terminals. Data Type, a company set up in Wales in 1979, is also marketing a big push into the graphics market.

Currently raster monochrome terminals are the most commonly used in graphics applications; in 1982 they made up 26% of the total units sold.

Raster colour terminals are more expensive to produce but as costs fall the market for colour is expected to take off. The business market in particular will boost colour sales because these terminals offer better identification for business charts – the main attraction of graphics for the business user is that it provides another means of analysing and displaying information.

Raster screen technology, using the cathode ray tube, has taken over from the direct view storage tube (DVST) which, although cheaper to produce and more versatile than raster, is expected to decline completely in the next five years.

The cathode ray tube offers excellent image quality and although flat screen technology is appearing, it can't yet match this quality. Tektronix is the main manufacturer of DVST screens and the length of time that they survive depends largely on how persistently Tektronix continues to market them.

One of the disadvantages is that DVST offers limited use of colour so raster colour terminals are predicted to take over most of the graphics market by 1988. At the moment they cost roughly twice as much as raster monochrome terminals, but costs are expected to drop. By 1988 they will account for a staggering 88% of the market.

In fact the market reports show that Tektronix' share of annual sales is likely to be threatened in the next few years by a number of the larger manufacturers who see a big future in graphics workstations – a market held at the moment by Hewlett-Packard with its 9000 series of personal computers.

The third type of screen on offer to the graphics market is the vector refresh display, sometimes known as calligraphic or random-scan.

Images on the screen have to be refreshed in the same way as those on a raster screen but vector refresh only needs a limited memory because unlike raster these screens don't store a copy of the image but only the instructions necessary to create it.

On the other hand vector refresh screens need rather more processing power but they are finding their biggest markets in the more industrially advanced countries in Western Europe, particularly in West Germany where they are used as important tools for CAD/CAM.

At present the UK takes the highest proportion of graphics terminals and alphanumeric terminals whereas West Germany goes in for workstations. And the UK, industrially more highly developed than some of its European neighbours, also leads the way in the use of raster terminals. Most of the DVST displays shipped to Europe find themselves in West Germany.

The OEM market for graphic display units is mostly devoted to graphics terminals using raster because large quantities of raster screen units go to systems builders en route to the CAD/CAM market.

According to IDC's report *Graphics Display Markets in Western Europe 1982-1988*, graphics terminals are the units hardest hit by the recession. Their use in development work such as CAD/CAM makes them a long term investment and tight budgets have hit the development side of the computer industry more than the rest.

However, increased user awareness about graphics means that users are discounting the budget problems that have prevented or restricted the use of graphics and these are now seen as essential in numerous applications.

**The demand for alphanumeric terminals is expected to take off because these will be units favoured by the growing armies of business users of graphics systems**

User awareness in fact will account for the anticipated boom in the business graphics market. As people with an understanding of the potential of graphics reach business management positions, sales of graphics units to this area will take off.

The proliferation of colour facilities will encourage business users, as will the recent availability of colour plotters at reasonable prices and software for business applications.

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**WORKSTATION AND ALPHAMUMERIC TERMINAL SHIPMENT VALUES ($M) BY VENDOR – WESTERN EUROPE – 1982**

| | Vector | Raster m/chrome | Raster colour | TOTAL |
|---|---|---|---|---|
| Workstations | | | | |
| Hewlett-Packard | | 41.5 | 26.4 | 67.9 |
| Tektronix | 15.9 | | | 15.9 |
| Other | | 12.0 | 3.9 | 15.9 |
| TOTAL | $15.9M | $53.5M | $30.3M | $99.7M |
| Alphanumeric terminals | | | | |
| IBM | | | 10.2 | 10.2 |
| IBM compatible | | | 0.6 | 0.6 |
| Other | | | 1.4 | 1.4 |
| TOTAL | | | $12.2M | $12.2M |

**GRAPHIC TERMINAL SHIPMENT VALUES ($M) BY VENDOR – WESTERN EUROPE – 1982**

| | Vector | Raster m/chrome | Raster colour | TOTAL |
|---|---|---|---|---|
| Tektrooix | 43.5 | 8.7 | 14.8 | 67.0 |
| Hewlett-Packard | | 13.5 | | 13.5 |
| DEC | | 4.4 | 3.2 | 7.6 |
| Intelligent Systems | | | 6.4 | 6.4 |
| Westward | | 3.2 | 0.3 | 3.5 |
| Ramtek | | 1.6 | 8.4 | 10.0 |
| Calcomp | 9.4 | | 4.9 | 14.3 |
| Sigma | | 3.9 | 1.4 | 5.3 |
| Genisco | | 2.3 | 1.0 | 3.3 |
| Chromatics | | | 2.8 | 2.8 |
| Megatek | 3.4 | 0.5 | 4.4 | 8.3 |
| Lexidata | | 1.2 | 0.3 | 1.5 |
| AED | | | 1.8 | 1.8 |
| Aydin | | | 2.1 | 2.1 |
| Imlac | 2.0 | | | 2.0 |
| Evans & S'land | 6.0 | | | 6.0 |
| Luody | 2.6 | | | 2.6 |
| Adage | 2.9 | | | 2.9 |
| Other | 5.0 | 6.6 | 8.0 | 19.6 |
| Captive | | 23.6 | 30.0 | 53.6 |
| TOTAL | $74.8M | $69.5M | $89.8M | $234.1M |

**WORKSHOP AND ALPHAMUMERIC TERMINAL UNIT SHIPMENTS VALUES BY VENDOR – WESTERN EUROPE – 1982**

| | Vector | Raster m/chrome | Raster colour | TOTAL |
|---|---|---|---|---|
| Workstations | | | | |
| Hewlett-Packard | | 3,770 | 2,030 | 5,800 |
| Tektronix | 1,000 | | | 1,000 |
| Other | | 360 | 170 | 530 |
| TOTAL | 1,000 | 4,130 | 2,200 | 7,330 |
| Alphaumeric terminals | | | | |
| IBM | | | 3,000 | 3,000 |
| IBM compatible | | | 250 | 250 |
| Other | | | 500 | 500 |
| TOTAL | | | 3,750 | 3,750 |

**GRAPHIC TERMINAL UNIT SHIPMENTS BY VENDOR – WESTERN EUROPE – 1982**

| | Vector | Raster m/chrome | Raster colour | TOTAL |
|---|---|---|---|---|
| Tektrooix | 4,000 | 1,000 | 750 | 5,750 |
| Hewlett-Packard | | 2,000 | | 2,000 |
| DEC | | 1,000 | 270 | 1,270 |
| Intelligent Sys | | | 1,040 | 1,040 |
| Westward | | 760 | 80 | 840 |
| Ramtek | | 30 | 320 | 350 |
| Calcomp | 180 | | 150 | 330 |
| Sigma | | 260 | 70 | 330 |
| Genisco | | 200 | 40 | 240 |
| Chromatics | | | 200 | 200 |
| Megatek | 60 | 20 | 110 | 190 |
| Lexidata | | 100 | 20 | 120 |
| AED | | | 120 | 120 |
| Aydin | | | 110 | 110 |
| Imlac | 90 | | | 90 |
| Evans & S'land | 60 | | | 60 |
| Lundy | 50 | | | 50 |
| Adage | 40 | | | 40 |
| Other | 90 | 1,060 | 660 | 1,810 |
| Captive | | 680 | 740 | 1,420 |
| TOTAL | 4,570 | 7,110 | 4,680 | 16,360 |

**GRAPHIC DISPLAY MARKET UNIT SHIPMENT GROWTH BY TERMINAL TYPE**
**WESTERN EUROPE – 1982-1988**

| | 1982 Units | % | Average annual growth | 1988 Units | % |
|---|---|---|---|---|---|
| Graphic terminals | 16,360 | 59.6 | 23.6% | 58,400 | 41.9 |
| Workstations | 7,330 | 26.7 | 25.1% | 28,100 | 20.1 |
| Alphanumeric terminals | 3,750 | 13.7 | 55.5% | 53,000 | 38.0 |
| TOTAL | 27,440 | 100.0 | 31.1% | 139,500 | 100.0 |

The fall in the prices of graphics units has slowed over the last two or three years because although the cost of memory has fallen the proportion of manufacturing costs spent on screen electronics has increased.

Alphanumeric terminals stand out from the rest in terms of market growth over the next five years. Sales of alphanumerics will increase dramatically by an annual average of 55% whereas the annual average rise in sales of all display types together will be 31%.

In 1982 IBM held 80% of this market with its 3279 terminal, but its dominance is not expected to continue as competition in the 3279 compatible market grows and expansion in business applications produces more low cost terminals.

And although Hewlett-Packard dominates the graphics workstation market in terms of units, Calcomp, another US firm, beats it on value share because it sells the more expensive vector refresh terminals and also supplies IBM with its 3250 units.

Altogether the graphics display market looks set for massive growth during the next five years. Estimates by IDC put that growth at an annual average of 28%.

This means that in 1988 nearly 30,000 display terminals of all kinds would be shipped in Western Europe, compared with a paltry 6,720 in 1982.

The technology that began as a tool to aid development in the car and aerospace industries is fast becoming recognised as an invaluable aid to the manipulation of every sort of data.

In 1971, the first potentially breakthrough in the use of graphics came with Tektronix' development of the 4010 storage tube display costing a mere $4,000, half the price of existing displays.

Falling memory prices promoted the development of raster displays and next will be a breakthrough in the technology of flat screen displays, to bring the image quality and efficiency up to that of the bulkier cathode ray tube.

**GRAPHIC DISPLAY MARKET UNIT SHIPMENTS BY TERMINAL TYPE AND COUNTRY – 1982**

| | Graphic terminals Units | % | Workstations Units | % | Alphanumeric terminals Units | % | TOTAL Units | % |
|---|---|---|---|---|---|---|---|---|
| West Germany | 3,750 | 22.9 | 2,030 | 27.7 | 800 | 21.3 | 6,580 | 24.0 |
| France | 3,270 | 20.0 | 1,360 | 18.5 | 780 | 20.8 | 5,410 | 19.7 |
| UK | 4,240 | 25.9 | 1,580 | 21.6 | 900 | 24.0 | 6,720 | 24.5 |
| Italy | 1,230 | 7.5 | 510 | 7.0 | 280 | 7.5 | 2,020 | 7.3 |
| Benelux | 870 | 5.3 | 480 | 6.5 | 150 | 4.0 | 1,500 | 5.5 |
| Scandinavia | 1,510 | 9.2 | 630 | 8.6 | 520 | 13.9 | 2,660 | 9.7 |
| Switzerland/Austria | 960 | 5.8 | 540 | 7.4 | 270 | 7.2 | 1,750 | 6.4 |
| Spain/Portugal | 550 | 3.4 | 200 | 2.7 | 50 | 1.3 | 800 | 2.9 |
| Western Europe | 16,360 | 100.0 | 7,330 | 100.0 | 3,750 | 100.0 | 27,440 | 100.0 |

# Animation is coming to the steam age

## John Charlton looks at some cartoon Antics

IF animation addict Alan Kitching has his way, cartoon creators the world over will soon be drawing images via a computer keyboard.

Kitching is the driving force behind Antics, a software package for producing animated images through a combination of a drawing board, a minicomputer, three screens and an image recorder.

So far Antics has been taken on board by Nippon Univac, which found Kitching's system to be far in advance of any other available animation system.

So impressed was Sperry's Japanese subsidiary that it bought the rights to distribute the system in Japan. This finance enabled Kitching and his colleagues to spend a year in Tokyo improving the software.

But the genesis of Antics was not simply a year in the land of the rising sun affair. It is a project to which Kitching has devoted the best part of 10 years.

After studying architecture in the refined air of Cambridge, Kitching moved to London where he began to complement his interest in animation with a growing knowledge of computers. He first dipped his toe into the ever burgeoning seas of computing at Univac, in the peace and love year of 1967.

Kitching's road to Damascus experience came to Vienna in 1971 when he saw his first examples of computer animation. Although he thought that these examples were "quite useless for practical animation purposes", he saw the potential for development.

But it was at the Royal College of Art (RCA), in 1972, that Kitching produced his first computer animation work. This consisted of the title sequence for a commercial film, for the British Film Institute, *Dream of Arthur Sleep*. During his time at the RCA Kitching met his future collaborator, fellow animator Jim Harker.

But the man who pushed Kitching in the direction of computerised animation was RCA computer artist Colin Emmett.

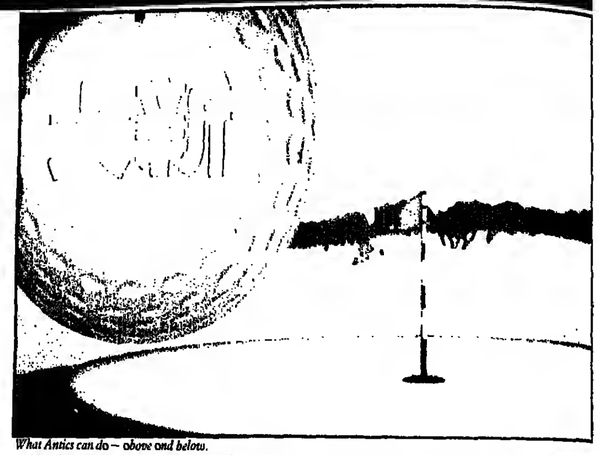
Emmett had already experimented with computer animation at the Atlas Computer Laboratory in Oxford. The aforementioned animated vide sequence for the BFI film was the immediate fruit of Kitching's partnership with Emmett.

More importantly, Kitching was persuaded by Emmett to learn Fortran, and to develop his ideas on computer animation at the Atlas Laboratory.

From 1973 to 1975, using a DEC minicomputer, Kitching laboured at the Atlas lab and produced the first Antics package. Kitching calls this stage the primordial version of Antics-Animated Technicolor Image Computer System – but it nevertheless won film an award from the British Kinematograph Sound and Television Society.

At the time Kitching's main problem was the limitations imposed on his work by batch processing. As he put it: "The hardware was too primitive to be a realistic production tool. It was a batch processor which meant that whenever you did anything, even the slightest alteration, you had to wait an hour or more to see the result."

Nevertheless Kitching had produced demonstrable results, and as computer hardware was, and of course is, advancing all the time, exciting developments lay ahead.



*What Antics can do – above and below.*

A demonstration at Ingmar Bergman's alma mater, the prestigious Swedish Film Institute, led to Swedish Television showing an interest in Antics. By now Kitching had set up an independent company with Harker, Grove Park Studio Animations, for the express purpose of developing Antics.

Between 1976 and 1978 the duo worked on what they called the palaeolithic (stone age) version of Antics. These activities took place in Stockholm, and the two computer animators used a Univac 1100 mainframe. Under the auspices of Grove Park Studios they tried to raise capital for the funding of further work on Antics.

This produced almost no response. After a short spell in England Kitching returned once more to Stockholm and used the computer animation package to produce cartoons for the 1979 Swedish general election.

Kitching says: "In the 1979 election broadcast we produced caricatures of the five party leaders, which we turned into an animated swingometer. As the swing went up and down, so the grins turned into frowns.

'All in all it was a clear demonstration of the productive potential of Antics. Yet we were still using the same machine that did all the studio's administrative work, so as soon as we started drawing the whole organisation came grinding to a halt. We needed full commercial backing for better hardware."

While visiting Nippon Univac in Tokyo Kitching demonstrated the Antics animation which had been produced in Sweden.

It seems that the Japanese company had looked in the US for computer animation equipment good enough to satisfy the needs of interested customers in television and the Japanese film industry. In return for exclusive rights to sell Antics in Japan, Nippon Univac provided the money and the facilities for yet further development of the "palaeolithic age" Antics package.

Kitching says: "Three of us, myself, Jim Harker and a girl who spoke Japanese worked full time in Tokyo during 1981 and 1982.

"There we devised one big Fortran program which consists of about 1,600 routines. The average routine is of the order of 50 to 60 lines. The main problem was getting the hardware performance just right. A real time full colour system would have been desirable. We used a DEC Vax, which was adequate for commercial purposes."

The version of Antics perfected during the time spent in Tokyo is now on commercial sale. Kitching says: "The software will sell for about £15,000 in Europe.

"We started putting the word out in May and everybody's interested, especially video, television and film companies. Unfortunately many of the interested potential customers don't have the right kind of hardware, which is quite a big investment.

**"We call the present version Stone Age because this is only the beginning."**

"But universities, polytechnics, colleges and the like should be a good market, as many already have the right sort of hardware."

In order to run "steam age" Antics a 32-bit processor is almost essential, as is a virtual memory system. So far it has been implemented under Vax/VMS and Prime/Primos. Storage required to run the software amounts to a minimum two Mbytes of actual core, but half an Mbyte may suffice if performance speed is not critical.

Grove Park Studios claims that the Antics software is device independent, as all program I/O instructions are handled by a group of back end routines. The minimum disc storage recommended is 80 Mbytes of high speed access.

Other hardware needed is a raster screen – any simple VDU will do – a line test screen, a colour screen, a drawing board, a tape recorder and a hardcopy unit.

The line test screen should be capable of displaying at least 100,000 vectors, and must have good alphanumeric text facilities. A minimum baud speed of 100K is recommended.

As for the colour screen it ought to have a minimum of six bits per pixel. Each pixel must be individually addressable and all pixels should be capable of storing a unique colour. This will give an availability of a quarter of a million colours at one time. Although the program can work with less.

Kitching believes that for the sake of accuracy a large drawing board is necessary, and an inductive stylus pen.

Various devices are recommended for the recorder. The cheapest is a conventional animation film camera recording directly from the screen under computer control. Alternatively small automatic units like those produced by Matrix or Calcomp will suffice. Video tape recorders may be used but these may require a custom-built computer control unit.

Now that Kitching and his Grove Park Studio company, which is located in Camberwell, South London, has taken Antics through the Primordial Age and the Palaeolithic Age, he says that the next step is the Steam Age.

To help him further this task Kitching is looking for some freelance programmers. They must have an excellent knowledge of Fortran, and also be interested in animation.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# CAD does much more than automate the drawing office

## Robert Fenner believes CAD/CAM should arrive at a single continuous design and construction process

CAD/CAM (computer sided design/computer aided manufacture) is a weddlog of two distinct processes. An object is drawn and the data which accrues from that process is directly employed in its manufacture. It is not simply about drawing or even designing.

Some CAD companies claim that for them CAD stands, not for computer aided design, but for computer aided draughting. Don't be fooled. The aim of CAD/CAM is to arrive at a single, continuous design and construction process. It is *not* to do little more than to automate the drawing office.

CAD/CAM in its fullest sense needs a large, minicomputer based system to apply it. Smaller systems tend to be sophisticated drawing tools which go some way towards supplying the information needed for the manufacturing process. What they have in common is a screen. This can take two forms.

The first kind is DVST (direct view storage tube graphics). A "writing gun" similar in principle to the cathode ray tube in a standard television set creates charge patterns on a luminescent screen. DVST graphics require a high vector refresh rate to maintain the image on the screen; they also suffer from what is almost the opposite problem. When a screen is reconfigured a line previously drawn on it sometimes takes a long while to fade. This is known as "ghosting". An advantage is that straight lines are represented cleanly and sharply.

The second, and nowadays more common kind of display, is the raster graphic device. With this method the screen, rather than being coated with a single uniform luminescent layer, is instead composed of thousands of "picture elements" or "pixels". On a monochrome raster graphics screen each pixel has a bit of RAM memory allocated to it: whether the bit is a "0" or a "1" will determine whether or not the pixel is live and part of the display.

In the early days the resolution of such screens was poor. Insufficient numbers of pixels meant that, say, a diagonal line or curve drawn on the screen would have "steps" in it. Nowadays, largely due to the falling price of RAM memory, the resolution of the raster screen is greatly improved.

A further result of the increasing cheapness of memory, and one that has led to the widespread adoption of raster technology by CAD system manufacturers, is that it affords the user a huge palette of colours. Different planes of memory in the system are assigned to different colours in the spectrum, each plane as in the monochrome system having a bit assigned to each pixel.

The combinations of bits in different planes produces the pixel's colour. Some of the larger CAD/CAM systems available are able to reproduce over 16 million shades of colour on one screen and at the same time.

Another feature which all CAD and CAD/CAM systems have in common is, naturally enough, a means of communicating with the image on the screen. The screen cursor may be controlled in a number of ways. One is the terminal keyboard. Others are devices you might find on video games in an arcade: joysticks, trackballs and thumbwheels. There are also light pens, which digitise an area of the screen when pressed against it; and there are digitising tablets.

Digitising tablets are coated fine meshes of wire laid out in tight grids on a table placed alongside the keyboard on the desktop. A cursor controller or "mouse" with a fine crosshair is passed across its surface; the cursor's position and the command given to it are activated when a button on the mouse is pressed. Digitisers, like raster screens, nowadays have a very high resolution. Some of them are accurate to within a millimetre or less.

CAD/CAM software's two best known aspects are the parts at either end of it. There is the design software, with facilities for either 2-D or 3-D representation on the screen; and there are the numerical control programs which convert the digitised data construed from the design into commands recognisable by machine tools.

Here, too, there are buzz-words. Those prevalent at the moment are largely concerned with standards for design software. They are CORE and GKS.

CORE is a proposal for a 3-D design standard. The package was developed by ACM Siggraph in the United States in the late seventies and submitted to the International Standards Organisation for approval. In November last year ISO rejected the proposal; CORE, it has been suggested, which outlined parameters for the definition of screen variables and of surface and solid modelling, was too rigid to admit some of the changes that would be demanded of it by movements in the graphics market.

However, it was widely adopted at the time – minicomputer CAD/CAM companies such as DEC had announced their intention to support it – and the American National Standards Institute is said to be revising it.

**A result of cheap memories is that it affords the user a huge palette of colours**

The idea of GKS, a 2-D proposal published as a draft international standard by ISO this summer, is that the user's application is isolated from the hardware while optimising its use. Thus the user may draft designs on a cluster of workstations – including combinations of DVST and raster screens – and still be able to transport his design from one machine to another.

DVST machines are enhanced, for example, by switch options which save power by only updating the screen when changes are made on it, while raster systems are conversely allowed to handle more of the display work in hardware. The user of CAD/CAM is not necessarily well versed in computer terms, and the idea of GKS and of most application packages, for that matter, is that they should cause as little inconvenience as possible.

Ease of use is one of the driving forces behind CAD/CAM. It is what gave rise to its most important recent development – the software bridging design and numerical control which allows a product design to be implemented more quickly.

Finite element modelling, as it is called, arose from solid modelling packages such as Shape Data's Romulus, CIS's Medusa and Pafec's Boxer. These packages "visualise" a solid object for the user on the screen but also provide information on the relationships between the object's various coordinate points and sides.

This type of information is the raw data of the numerical control program; the designer no longer has to re-key all the data which accrued from his original work. With the design still on the screen, he can check it for logical innaccuracies, expose it to simulated stress and even run it through a simulated machining stage to check the cutting paths of the tools which produce it.

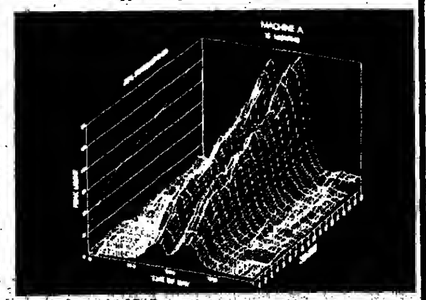
He can then generate a finite element mesh and send its coordinates to the numerical control application in a very short time indeed – on Romulus, for example, such an operation during the production of a racing car engine part took only 10 seconds. He can also, incidentally, with other application packages standard to most software suites, obtain such information as a bill of materials for costing purposes.

The possibilities afforded by this kind of power are enormous. A design, test and production cycle can be worked through to its end from one office, supervised by one team. With interactive devices that are simple to use, and menu-driven commands that are simple to learn, the architect, PCB designer or mechanical engineer can concentrate on the job for which he was trained.

CAD/CAM is his tool, not the bane of his life. He can even decide how he wants to use it: on Applicon's system, for example, he can designate his own instructions. A circle around an object could be made, say, to indicate a "zoom in". Every time a circle is drawn and the cursor released, the command would be automatically initiated. This kind of facility automates the drawing office; but also, with access to the rest of the manufacturing schedule, the office provides a single centre of information.

Systems which provide the accuracy and continuity of what is now called "true CAD/CAM" are available from the mini CAD/CAM companies and their software suppliers.

*CAD/CAM is a tool – not the bane of an engineers' life.*



*A typical example of CAD.*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GRAPHICS

# Paper gobbling printers and plotters complete the picture

## Mike Sawyer charts What's What in the market for printers and plotters

WHATEVER happened to the promise made by the infant computer industry that the paperless office was just around the corner?

Paper gobbling printers and plotters are an integral part of all computer systems. They produce highly reliable copy, are a useful backup system for the sometimes unreliable electronic storage media and provide the easiest means of communicating computer output – especially in a business environment.

No office undertaking computer aided design (CAD) would be complete without its graphics plotter to draw up designs which can now be accurate to 1,000th of an inch.

Similarly, no business office would be complete without a printer of sorts to handle data processing, word processing and the occasional graphics.

Indeed, the fact that graphics options are offered on computer hardware by manufacturers is often a major selling point to the computer user and potential buyer.

The spread in use of computer generated graphics has helped to coin the phrase 'visual management' – summing up the notion that a picture is worth a thousand words.

The most common and popular form of graphics printer is the dot matrix kind.

Matrix printers work on the principle of constructing letters or characters by using matrices of dots. The print head consists of a set of pins, each of which can be fired at an inked ribbon to form the character required.

Plotters, on the other hand, use pens controlled by an arm which pushes the pen in the direction required.

There are two types of graphics plotter. One is the drum version, in which the pen moves only in the horizontal direction – the X direction. Vertical lines, the Y direction, are achieved by rotating the drum on which the paper is held.

The other type of plotter is the flat bed plotter, which as the name indicates, holds the paper or drawing material on a flat work surface. The plotter's arm then moves the pen across the paper in both the X and Y directions.

Matrix printers are capable of producing high quality graphic output with the added advantage of producing printed text as well.

And matrix printers are usually the more popular version for the average business user for, those reasons. As their quality improves the matrix printers will probably supersede the dedicated graphics plotter in the business user market.

Plotters are slower in producing output than matrix printers and are usually more expensive, but offer more accurate and much higher resolution graphics.

When buying a hard copy graphics output device this first consideration must be the use to which it will be put.

If it is only for the occasional bar chart, piechart or line drawing for example, where very high accuracy is not required then the matrix printer will do.

Many matrix printers come with colour printing capability but it is only towards the top end of the range that the variety of colours available matches that of plotters. Printers at the low end of the market usually offer either black/white or only two or three colours.

Plotters are usually sold with fibre tip or liquid ink pens which offer a virtually unlimited range of colours.

If your interest is computer aided design, necessarily using a plotter for accuracy, it may be useful to point out that a recent survey found the most popular choice of pen for plotters was the good old ball pen. It is proven, cheap and very hard to damage. Next most popular but a long way behind the ball pen was the roller ball type pen, followed by liquid ink pens and finally the fibre tip pen.

A quick glance at the printer market shows that around half the daisywheel letter quality printers on the market come with graphics potential. Also, two thirds of printers sold have graphics as standard and all matrix printers offering a wide range of colours are adapted for graphics.

Prices for the matrix printers can range from as little as £80 – the price of the Amber 2400 matrix printer supplied by Lethaby Numbering of Andover.

The Amber has a low quality print suitable for home computer users and has a maximum print speed of 15 characters per second and prints on 5.8 cm wide paper.

At the other end of the scale is the £4,590 Trilog T-300 supplied by Datatrade of Northampton. This matrix has a maximum print speed of 400 characters per second and prints on paper 16 inches wide. With both serial and parallel interfaces the Trilog can be used with the most popular business computers.

In between these two extreme examples lies the heart of the matrix printer market.

The British Army used to have a saying – the cheapest is the best. Well the Japanese made Shinwa CTI-CP80 matrix printer is certainly one of the cheaper versions to offer the full range of features, including graphics.

First and foremost the Shinwa sells from under £300 and has both Centronics parallel and RS232 serial interfaces, allowing the machine to be used with most business micros and home computers including the Dragon, Oric, Apple and Sirius.

The machine has a paper width of 10 inches which is wider than A4, prints in black and white and has a buffer of 64K.

This buffer allows the machine to take instructions from the computer in chunks of 64K. It means that while the printer is in action the computer can perform other tasks.

Text print speed on the Shinwa is 80 characters per second and quality is reasonable due to the 9x9 dot matrix printing.

Features include italic, condensed, emphasised and expanded print styles, vertical and horizontal tabs and an 80 column print width.

Going up market a short way, for around £545 the Brother HR15 offers higher text print quality than matrix printers because it is a low cost daisywheel printer with graphics capability.

Its speed is 13 characters a second and it offers compatibility with a wide range of micros with both the RS232 and Centronics interfaces.

The HR15 features red and black colour printing, paper width adjustable to 12 inches and a buffer of 3K.

For those wanting the exceptional quality of the daisywheel plus the occasional graphics capability this machine might suit very well.

Features include text reprinting for large quantities of reports and soon, auto underscoring, proportional spacing and a maximum of 165 characters per line. The HR15 is also quiet enough to use in a busy office.

Going up market again we come to the Anadex DP-9501A line printer, price around £1,150.

This machine has high resolution graphics capability which means it can pince n large number of print dots in a small area.

The printer has n fast speed of 120 characters per second at letter quality standard. The machine also has the added option for those with data processing in mind of an alternative print speed of 150 characters per second.

High resolution graphics is achieved by the 11x9 dot matrix print head which allows 75x72 dots to be printed to the inch.

Paper width is up to 15.6 inches and the buffer is 2.7K which Anadex says allows maximum efficiency when operating in the graphics mode.

Like the other machines reviewed so far the Anadex has both RB232 and Centronics interfaces together with another current loop interface as standard, which covers most eventualities in the choice of computer hardware.

A mark in the Anadex's favour is its low noise level.

Features include optional reinking ribbon, printing up to 220 columns wide, double width and bidirectional printing, horizontal and vertical tabs and normal or compressed type styles.

Towards the top of the matrix printer range is the Facit 4544 which should sell for around £2,796.

The Facit's leading claim to fame is unlimited colour graphics capability. With a standard four colours integral to the machine Facit says unlimited colour can be achieved by overprinting one colour on top of another.

With a maximum print speed of 300 characters per second the Facit has an adequate 8K buffer and RS232 and Centronics interfaces. Paper width is a large 15 inches.

Features include the unique Facit font which through software commands can generate variable sizes of type characters. The company says you can put a dot anywhere on the paper and in any colour. Character sizes are software controlled and can vary from 1-96 characters. A 96 character roughly equals 9½ inches.

Although the Facit machines speed is a fast 300 characters per second in print mode there are matrix printers available offering speeds in excess of 800 characters per second, but these machines do not necessarily offer graphics.

If high quality graphics are an integral part of the business requirement then perhaps two machines, a printer for text and a plotter for graphics may be the answer – the printer for print speed and the plotter for graphics accuracy and quality.

One of the lowest priced of the drum versions is the Strobe 100 costing £576.

The Strobe offers single colour plotting on paper 8½ inches wide or A4 size.

There is no buffer on the machine but it does have the RS232 and Centronics interfaces allowing use to be made of the Strobe on most leading makes of microcomputer.

Although slower than many of its rivals the Strobe has an advantage in that it is well served by software enabling the plotter to be run off a large number of machines without the users having to write their own specialised software.

At just a tiny bit farther up the market at £599 comes the Pixy three colour flatbed plotter.

With eight-bit parallel and RS232C interfaces the Pixy can be used by the home computer buff as well as the business user with an IBM or Apple micro to produce bar charts, piecharts and flow charts etc.

Paper width is 8½ x 11 inches and the machine can take either paper or film such as that used for overhead transparencies. Water, oil based and fibre tip pens are available for use with the machine.

Features include eight colour pen options, normal and extended and Greek type styles and local intelligence. This latter means the plotter can act independently of the computer to generate circles, arcs and spiral illustrations.

Just out is the new Hewlett-Packard HP 7470A supplied by Hi-Tek Distribution.

At £969 plus VAT it is a two pen multi colour plotter which is compatible with the Apple II, Commodore Pet, Hewlett-Packard 85 and 87 and IBM PC micros.

It can take either 8½ x 11 inches or A4 paper as well as film for transparencies.

Two colour plots can be produced automatically and multi-colour plots with a manual change of pen. A new paper gripping technique is used for plotting which moves both pen and paper at the same time.

Features include five internal character sets, simple paper loading and the software allows users to give typewritten commands in plain English.

In a similar price bracket comes the Iwatsu SR-6602 intelligent graphics plotter priced between £950 and £950, depending on which interface is supplied with the machine.

The Iwatsu can take A3 size paper, has a choice of self-test printer, or plotting mode and has random access memory of 14K and read only memory of 8K.

At £2,290 for the A3, 11 inches version, the Gould Colorwriter is certainly not the most expensive of printers but it does offer a lot of the features seen in more costly machines.

It can use 10 pens, for example, which can be either fibre tip, roller ball, transparency quality or the popular Rotring draughtsman's pens.

The machine has five different character sets, including upper and lower case draft quality and the mathematic Greek alphabet.

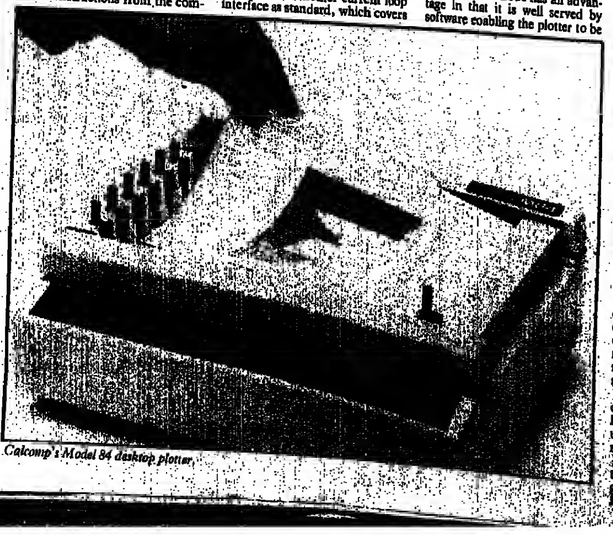
With variable line fonts, cross-hatching, bar and piecharts, arcs and circles can all be plotted on the Colorwriter at a plotting speed of 40 cm per second. The more standard speed of plotters is around 10 cm per second.

Features include a buffer of 2K expandable to 16K and the 663 model can be programmed for unattended and continuous plotting through its automatic paper advance procedure. The machine still retains its facility for single sheet plotting.

Finally, at the very top end of the plotter market is Versatec which makes a range of plotters from a 22 inch version, capable of plotting on paper or film 22 inches wide with a plot width of 21.6 inches through plotters sized at 30, 36, 42 inches up to the 72 inch version, the largest plotter on the market.

These plotters are suitable for plotting full size drawings, maps, seismic sections, piping and network diagrams, pert charts and business graphics.

The HP 7470A graphics plotter.



Calcomp's Model 84 desktop plotter.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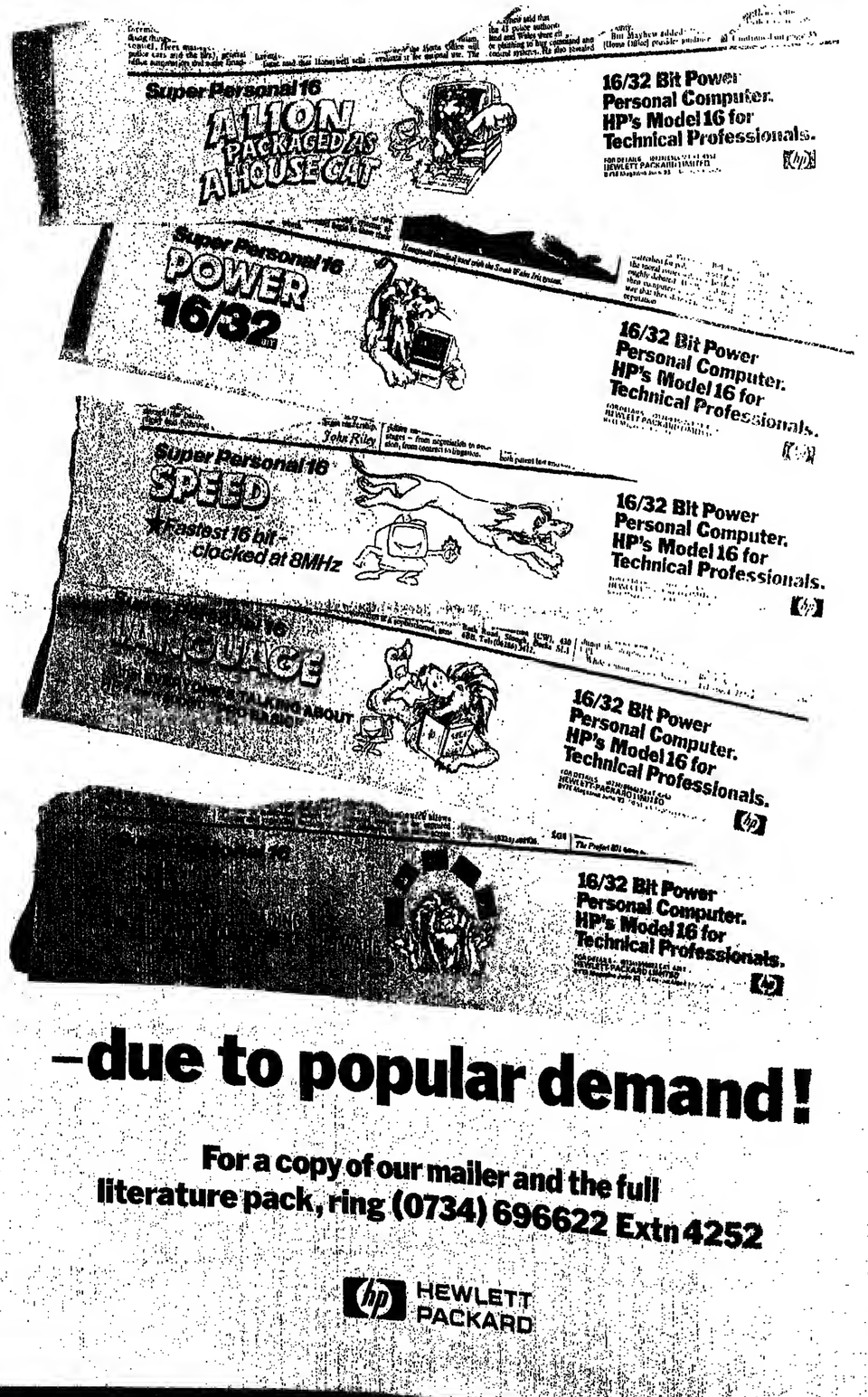


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HEWLETT PACKARD




PEOPLE

# BCS names the two top scholars

THE British Computer Society has announced the winners of the Ferranti Awards for 1983. Awards are made to those candidates who gain the highest marks in each part of the society examination.

The Ferranti Award for Part I has been won by Ruth Elaine Leather. Leather is a senior programmer on common software with the Central Computer and Telecommunicstions Agency in Norwich.

She joined the CCTA just over five years ago, when she moved from Yorkshire to East Anglia, on gaining a degree from the University of Leeds.

Jeff Gallant, who is responsible for operating procedures at the Central Office of Information, has won the Ferranti Award for Part II.

He is presently investigaung the possible introduction and installation of microcomputers in the COI.

Before joining the COI 15 months ago, he worked on social surveys for the Office of Population Censuses and Surveys for eight years. He studied for Part II of the Society Examination at North Staffordshire Polytechnic under a block release schemc, organised by the Civil Service College, and directed studies.

The awards comprise a medal and a cheque. They will be handed to the winners at the BCS Awards Evening at the Royal Society on December 1.

■ Emulex Corporation has appointed Peter Weill (above) as managing director of European operations. In the newly created position, he will be based in the UK. He was formerly president of the Paeific and South American Marketing Group for Mohawk Data Scienecs, and has held senior management positions at the Univac division of Sperry Rand, ICL and Honeywell.

■ National distributor and dealer support for Ashton-Tate's micro software products is now handled by Ricky Leah in the South and Ian Tomalin in the North. They are both graduates with considerable sales experience.

■ John Whyte has joined Plessey as chairman of Plessey Telecommunications (International). He recently retired from British Telecom, where he was managing directcr, major systems, and engineecr in chief. Plessey Telecommunications (International) is a subsidiary of Plessey Telecommunicatioos and Office Systems, set up to promote exports, primarily of System X.

■ Zygal Dynamics, supplier of computer systems and professional microcomputers, has appointed Mark Kirton (above) as sales executive at the company's business centre in the City, The Computer Terminal. Kirton specialises in selling financial planning software packages and business systems. He joins the company from Olivetti where he spent two years working as a sales executive.

■ Michael Chastney has been appointed data processing manager of AGB Consumer and Financial Research. He was previously with the Ford Motor Company at Dagenham.

■ Paul B. Livesey has been appointed director of corporate information and services at NCR's world headquarters in Dayton, Ohio. Since 1977 he has held the position of manager of information systems for NCR's UK company.

■ Michael Tudor-Craig has joined Seicon as Navy marketing manager in the company's Defence Department. Before joining Scicon, he was directcr of the Maritime Tactical School, HMS Dryad. Previously he had been in command of the 6th Frigate Squadron nnd was ADC to the Queen in 1981.

■ Gandalf Technologies has appointed Dr Tudor Bunaciu as European marketing manager, Gandalf Services SA, in Geneva, Switzerland. He has an extensive background in computer networking, as well as in marketing data comaunications equipmeru and services.

■ Memory Computer has appointed Tony Serese (above) distributor sales executive with responsibility for liaison with distributors and dealers throughout the South of England. He joins Memory froro Io Technology, a British manufacturer of standalone mieros for whieh he carried out a similar operation setting up a total of 70 independent dealers.

■ Jon Long (below) has joined Harris Systems as a marketing specialist for computer aided engineering applieations. Prior to joining Harris, he was an engineering consultant with SDRC Engineering Services and CAE International, where he was a senior technieal consultant.

■ Altos Computer Systems has announced appointments of Bryn Jenkins as product support engineer and Barbara Wells (above) as dealer representative. Jenkins will be responsible for both pre-sales and post-sales support operations in OEM and distributor markets. Previously he was a sales support analyst with Transdata. Wells will fulfil a snics support role for all Altos dealers. She was previously commercial systems specialist with Data General.

■ Richard Harding has joined Peachtree as a senior programmer with responsibility for supporting PAAS, Peachtree Apple Accounting Software, previously known as Vlasak. He joined Vlasak as development manager in 1980. Chris Robinson has also joined Peachtree as dealer salesman to develop a new dealer network in the UK. He joins Peachtree from Vlasak Computer Systems, where he was sales execu-tive.

■ Stephen Prentice (above) has joined Pearl Software International (UK) as marketing manager. He was previously with the Osborne Computer Corporation as UK software manager and has also spent five years working in computer/communications consultancy with Logica.

■ Tom McCallum (above) has been appointed to the position of regional manager, Data General, covering the Midlands, North of England and Scotland. He has been with Data General for five years, holding the position of branch manager, London, for two years, and manager, Scotland, for three.

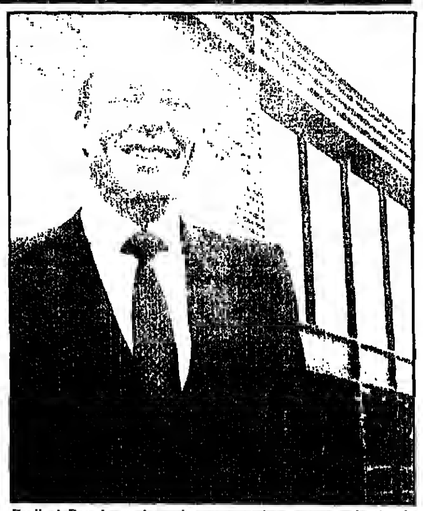
■ G. English Electronics has appointed Dave Wood as managing director. He was recently VSL's marketing director, later becoming director of sales and marketing, components division.

■ The Marconi Company has appointed Ian R. Sutherland to the new position of chairman of the board of Marconi Electronics Inc in the US. His previous position was managing director of Fairey Allday Marine.

■ The University of Newcastle upon Tyne has appointed Dr Peter Hitchcock to the Readership in Data Processing. Formerly he was a member of the Computer Science Department at the University of Victoria British Columbia, Canada. There Dr Hitchcock developed several courses in computing for British Columbia's educational television channel. He has published a number of papers and reports

■ Frank L. Hill has been appointed general marketing manager for 3M Data Recording Products. He was recently manager responsible for both sales and marketing functions of 3M's office markets and professional arts group. Also appointed is Martin Luddington, as marketing manager.

■ David Farr has been appointed computer services manager of Calibration Systems, the Camberley-based calibration and servieing company. He will be responsible for the continued development of the company's computer aection, which currently repairs micros, minis, development systems and computer peripherals. He joins CSL from Computer Field Maintenance, of Feltham, Middlesex, where he was responsible for the supervision of the servicing of Hoskins/Intel systems. Before that, he was with the Royal Signals for six years, as a terminal equipment teehnielan.



*Feedback Data has made two important appointments to strengthen its sales and marketing activities. Rob Hollands (above) has joined as marketing director, a newly created position in which he will be responsible for all of the company's sales and marketing activities. He joins Feedback from Transdata, where he was sales director. He has also held senior positions with a number of US based computer manufacturers, including Honeywell, Burroughs, NCR and Perkin-Elmer Data Systems. Vic Cornelius has been appointed commercial manager. He joined the company in 1967. During his period as sales manager, Feedback Data become well established as a manufacturer of industrial data terminals and cartridge tape systems.*

DIARY

**SEPTEMBER 19-23**
The User Interface: Human Factors in Computer-based Systems is a course run by the University of York, Healington. Details: Andrew Monk, (0904) 59861.

**SEPTEMBER 20**
Seminar on Structured Analysis is designed for managers to evaluate the use of these methods for their own companies. It takes place at the Copthorne Hotel, Crawley, Sussex, and costs £20. Details: Brenda Wigley, (0293) 31211.

**SEPTEMBER 20-21**
The Status Users Group annual conference takes place at St Peter's College, Oxford. Fees are £45 for members, £55 for non-members. Details: Jim Hetherington, (0532) 737475.

Computing Concepts for Managers is run by the National Computing Centre at the London Training School, fee £265. Details: NCC, (061) 228 6333.

**SEPTEMBER 20-22**
The Prime User Group conference takes place in conjunction with the Prime Education User Group at Surrey University, Guildford. Cost per delegate is £70 residential, £50 non-residential. Details: Ray Balmer, (0925) 35953, ext 2619P.

**SEPTEMBER 21**
Software Engineering Databases is a meeting of the British Computer Society's Software Engineering Specialist Group, at Birkbeck College, London.

The first of a series of one-day financial seminars for data processing managers and accountants by Management Science America takes place at the Park Lane Hotel, London. The series runs until October 25 and covers credit management, financial applieations, payroll and decision support. Further information from Yvonne Cattnter, (0628) 71011.

**SEPTEMBER 21-23**
Data Training runs its CICS course for IBM Cobol programmers in London, fee £230. It is repeated October 5-7 in Manchester, ond October 19-21 and November 9-11 in London. Details: Philip Corker, 01-404 5444.

**SEPTEMBER 22-23**
Data Facility Products is a Xephon course at the Royal Kensington Hotel, London, costing £370. Details: Mary Haines, (0628) 74922.

**SEPTEMBER 22-23 or 29-30**
Two more seminar/workshops are being held on Interactive Video in Action. Run by Future Media, they cost £275 each. Details: Future Media, (0243) 867811.

**SEPTEMBER 26**
Introduction to d/BASE II is a course run by the Computer Training and Education Centre at its London centre. Other courses in September are Z80/8080 Assembler, Programming in d/BASE II, and CP/M80 Operator Level. Details: Richard Lee, 01-251 4010.

**SEPTEMBER 26-30**
Data Analysis Workshop by BIS Applied Systems takes place at Queens Hotel, Eastbourne. It is designed for members uf data processing and user departments on projects with complex data relationships, and will train in new methods of analysis and design. Cost is £630. Details from Cherry Bigmore, 01-261 9237.

**SEPTEMBER 26-28**
Minis/Micros with IBM Mainframes is being held by Xephon at the Waldorf Hotel, London, price £490. Details: Mary Haines, (0628) 74922.

**SEPTEMBER 26-28**
Office Automation and Integrated Information Processing Support Systems is a Frost & Sullivan seminar to be held at the Cumberland Hotel, London. Fee is £425. Details: Carolyn Budd, 01-486 0334/5.

**SEPTEMBER 26-28**
Software Maintenance, a seminar held by Management & Training Services, takes place in London. Details: David Peters, (07842) 57373.

**SEPTEMBER 26-30**
The Pascal Workshop is run by the Control Data Institute, in London. Further information: Jackie Barclay, 01-637 2171.

**SEPTEMBER 26-OCTOBER 14**
Datasolve's ANS Cobol Programming Workshop takes place at the Education Centre, London. Cost is £760. Details: Joan Clarke, 01-499 7099.

CONFERENCES

■ THE ECOMA-11 conference will take place in Copenhagen from October 4-7, 1983 at the Hotel Scandinavia. The theme will be Cost Control and Performanee Improvement in the Modern Information Centre. There will be two capacity planning seminars by the guest speaker, Dr James A. Larson, head of integrated data management at the Honeywell Technical Centre in Minnesota. His first tutorial, Database Management in the 1980s, is designed for managers and technical practitioners, and will provide an in-depth examination of the characteristics, advantages and disadvantages of DBM and DDP systems in the '80s. His second seminar, Facilities for End Users in the 1980s, will evaluate the trends and techniques which enable non-computer managers to interact most easily and effectively with computerised systems. There will also be a series of professional development seminars and tutorials by long-time users of CPE tools, and a seminar, Financial Techniques of Cost Accounting and Management Presentations. Details from Seott N. Yasler, ECOMA-11 Conference, Scheuchzerstrasse 5, CH- 8006 Zurich. Tél: 01-362 1268.

■ THE International Conference on Machine Translation takes place from February 13-15 next year, at the Cranfield Institute of Technology, Bedford. Organised by the Institute in conjunction with the Natural Language Translation Specialist Group of the British Computer Society, the conference will cover analytic and software techniques of machine translation, and MT's relevance to developments in word processors, computer-assisted learning of languages and information retrieval. Fees are £176, or £132 for BCS members. Residential accommodation at Cranfield is available for £75. Further information can be obtained from Douglas Clarke, Department of Mathematics, Cranfield Institute of Technology, Cranfield, Bedford MK43 0AL. Tel: (0234) 750111.

■ Call for papers has been issued for the fourteenth International Conference on Fault-Tolerant Computing, which will take place from June 20-22 next year, at the Hyatt Orlando Hotel, Kissimmee, Florida. It is run by the IEEE Computer Society's Technical Committee on Fault-Tolerant Computing. Five copies of papers, double-spaced and 1,000-5,000 words in length, should be submitted by Noverober 18. Further details from James H. Stewart, Sperry Corporation, Computer Systems, MS U2U22, PO Box 43525, St Paul, MN 55164-0525, USA. Tel: (612) 456 3858.

# Greece leapfrogs into information technology

## Jack Gee looks at a nation seeking a foothold in the computer league

LIANIS . . . *"We don't want any colonial relationships with our partners."*

GREECE is about to embark on a venture to set up a microelectronics design centre and establish its own software industry, with the aid of Greek specialists now working in North America and Western Europe.

The design centre will be one of the key elements of a five-year plan to develop high technology industries, recently approved by parliament. It will get underway in 1984.

Struggling against inflation, which has been running at 25%, and a slump in receipts from tourism, shipping and Greeks who are working abroad, Greece may appear ill equipped after two years of socialism to move into the computer league.

But the country's leaders consider that the shortcomings of its economy make it vital for industry to leapfrog into advanced information technology.

A start has been made with the creation of a research institute associated with the Institute of Information Technology at the University of Crete. The institute will work on office automation and other projects as a partner in Esprit, the Common Market's effort to make up the gap between Europe's computer industry and the industries of the US and Japan.

"We have the brains to do this," says Minister of Technology George Lianis. "We have the people – here and abroad – and the capability to develop our own software industry and move into microelectronics manufacture."

Coming from Lianis, this self assurance cannot be dismissed as wishful thinking by a politician trying to whip up support at the hustings. The bearded, 56-year-old minister, who looks more like a university professor than a cabinet member, is the only one of the Common Market's 10 ministers of technology with a genuine background in the field.

He holds a doctorate in mechanical engineering from Imperial College, London, where he became a research fellow in aeronautical engineering. He taught in the US for 17 years before returning home after the overthrow of the military dictatorship.

Earlier this year he made a tour of the US and Canada to address meetings of expatriate Greek engineers, many of whom expressed enthusiasm to return and join in the national effort to endow the country with an information technology industry. Lianis has also established contacts with Greek experts in Britain and France.

At the beginning of this summer these specialists from the Diaspora gathered in Athens to take a hard look at what was feasible. This seminar was the genesis of the Design Centre, which will be located in the capital and associated with the National Centre of Physical Sciences, Democritos.

Between \$2 million and \$2½ million are being allotted to this project. Greece has asked the Common Market for cash support to the tune of seven or eight million ECU.

"At this stage we are not planning to build a chip factory of our own," says Lianis. "We want to start with a small VLSI unit for research and possibly for small-scale custom production. We intend to give special priority to CAD/CAM design and testing and to systems architecture."

Because Greek salaries are so much lower than those paid in Western Europe and North America, the minister envisages high added value for both software and hardware.

But Greece will be particularly careful to ensure that foreign firms and countries do not establish a foothold with the objective of taking over this nascent industry. Although the Greeks realise they will need American technology, they are particularly wary of the US, with which they have just negotiated an agreement for the closure of US military bases within five years.

"We don't want any straight foreign investment," says Lianis. "We don't want any colonial relationships with our partners."

At any academic level, Greece appears well geared to launch into microelectronics and information technology. Computer science departments exist in all the country's six technical universities. As well as the overseas Greeks whom the government hopes to lure back, a number of trained specialists are already available at home.

"Our plan is to move into microelectronics in a manner that will produce the maximum impact for a minimum investment," says Stavros G. Katsafouros, who, after 22 years in the US, is now microelectronics consultant at the Technology Ministry.

Katsafouros explains: "To enter the microelectronics spectrum on a broad front is too expensive for a small country with limited resources. But there are easily defined stages by which we could break in."

The Design Centre will have the task of keeping up to date with the state of the art and finding niches in which to develop subsystems. Design will begin at university level and the centre will co-ordinate multipurpose chip design.

"The centre will have ample resources in computer power," says Katsafouros. "These will be located either in the centre itself or at a silicon foundry abroad, where wafer processing takes place. This means that the design engineers can simulate what they are going to produce on a chip, as well as simulating the logic at circuit level."

Lianis stresses that high quality telecommunications are essential for gathering information on multi-purpose chips and communicating with facilities overseas. "This is one of the reasons why we are renovating our telecomms network and moving from an electromechanical to a digital system," he explains.

The government is currently studying tenders from GRE, Ericsson, Siemens and ITT for proposals to set up a Greek switching exchange industry.

Curiously enough, France is not competing for the contract, although Thomson-CSF has installed Athens' international transit centre using its MT system.

To help remedy Greece's lack of experience in semiconductors, special courses are being introduced into university programmes. Katsafouros says: "Since students need hands-on access to circuits, we are building a fully fledged laboratory facility for this purpose at the Democritos research centre. Fundings totalling \$300,000 have been allocated for this task."

The Greeks consider that, at the crossroads between Europe and the near East, they are ideally situated – both politically and geographically – to export the products of their future microelectronics industry.

Katsafouros explains: "We are not starting completely from scratch. There is a small Greek firm, Gigatronics, which has been selling minicomputers and software of its own design for the past five or six years."

> **The Greeks consider that, at the crossroads between Europe and the near East, they are ideally situated – both politically and geographically – to export the products of their future microelectronics industry**

Software, he says, provides immediate opportunities for development, because it is labour intensive. "We have unemployment in our scientific community. So people are available to design software tools to help with the telecomms aspect of hardware."

Greece is particularly keen to use its own specialists with experience in data packet switching.

Katsafouros says: "A major problem is how to transfer to industry the know-how acquired in research projects. Institutes like France's National Centre for Telecommunications Research do this particularly well. The centre's experience has been passed on to French industry with excellent results. We should like to follow this example in Greece."

He adds: "The great advantage of the modern technologies is that you can jump on the train at any stage. But you have to be careful because there are built-in risks."

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# Networking standards make rapid advances

## Dr Ken Beauchamps of Lancaster University reports on a NATO Advanced Study Institute on Information Technology and the Computer Network

NATO Advanced Study Institute on Computer Networking has been part of the regular success at the Chateau de Bonas in the South of France since 1978, when the first meeting on interlinking computer networks took place.

In 1981 a second meeting on advances in computer networking reflected the considerable progress that had been made during the intervening years, particularly in the area of communication protocols (*Computer Weekly*, July 23, 1981).

This year's meeting, occupying 10 working days between August 22 and September 2, co-directed by Dr Jack Howlett and myself, was concerned with the computer network supporting the wide range of services demanded by present-day information technology and the future development of these services.

McCRUM . . . *"Top priority for inter-networking activity."*

Some 70 scientists from 15 countries assembled at Bonas for the two weeks to discuss on-going problems in computer communications and how the networks will respond to the demands of information technology during the next decade.

Several major themes emerged from the lectures and workshops. These included standardisation, security, networks management, the proliferation of services and the transition to open networking.

Keith Bartlett of the Department of Trade and Industry opened the meeting with a challenging list of requirements to be met by users and providers of network systems alike.

To capitalise upon the considerable benefits of information technology users will have to adjust to its many demands. These include flexibility, a reliance upon facts and commitments not recorded on paper, and an ability to interwork between a wide variety of systems which presently are considered to be separate.

These systems may be text, image or voice-based and will eventually originate from different manufacturers. Their interworking will demand standards covering correction, communication, data exchange and systems management.

Bartlett pointed out that information technology is essentially an international activity and we are foolish if we overlook this. The key to IT is standards and it is dangerous for experts to treat this as their own subject.

Standards mean achieving certain levels of excellence and levels of performance, as well as uniformity of dimensions, operations and protocol. Above all, OSI (open systems interconnections) does not mean open to several interpretations!

The meeting was particularly fortunate in having a workshop on the British initiative in IT – the Alvey report chaired by Brian Oakley, the director of the UK Alvey Programme.

The Alvey Report stemmed from the Japanese Programme for the Fifth Generation of Computers and after a visit to Japan by the British team, led by Sir Robert Telford, it came back convinced that the UK must have a parallel initiative of its own. Brian Oakley described the shape of this programme in terms of VLSI, software engineering, information knowledge-based systems, computer power and man-machine interface.

It was the shock of realisation of Japan's determination to go ahead fully in these areas through its long-term ICOT programme that led to the formation of not only the UK's Alvey programme, but also the European Esprit scheme, and several US initiatives such as the MCC and DARPA programmes for powerful networks and computers.

Brian Oakley paid tribute to the enthusiasm of Sir Robert Telford of GEC and Kenneth Baker, the Minister for IT, for getting the Alvey Programme off the ground. This is probably the first time outside a wartime situation that the nation has co-operated in such a way over a single technical project and he expects that the programme will double Britain's research manpower within the next five years.

Although the programme he is managing is a British one he anticipates full co-operation with Esprit and many other similar worldwide programmes. He hopes this will enhance the benefits arising from the work for the remainder of this decade.

Later in the week we were to learn something of the US supercomputer projects from Professor Frank Kuo of SRI International, US. The two principal projects are the \$46 million Fifth Generation Computer Project, the DARPA technology-based supercomputer project for which \$40 million has been allocated and the MCC (Microelectronics Computer Technology Corporation), a joint project for 10 US companies.

The goals of these projects were described as leading to knowledge-based information systems, speech and natural language understanding, vision processing, parallel architecture and a supporting network hierarchy.

The reward is technology leadership and market dominance and it is Kuo's view that we can expect to see the emergence of those presently little-known, small companies which can afford to be innovative and take risks that the large, organised corporations feel unable to take.

In an important session in standardisation, the principal speakers were Professor Hans Helms of the Commission of European Communities (CEG); Jim Brookes, director of the UK South-west Regional University Computing Centres, and Jock Houldsworth of ICL.

Professor Helms stated that the CEG has invested heavily in international standardisation since 1979 and its strategy is similar to that proposed under the Esprit programme and Euronet, with which it has close co-operation links. The number of agreed and operational standards within the various levels of the ISO seven-layer protocol model is already very impressive, 47 in layer seven, 18 in layer six, etc. There are over 100 in all, plus 75 standards which do not involve data links.

The manufacturer response to these standards has been good – they need the market. The user response has not, however, been as good and this points to an educational need which is far from complete.

As with many such organisations, the CEG is presently considering a strategy for the introduction of OSI standards to ensure that systems which are being planned now to use data transmission facilities (both wide area and local area networks) can be structured so that they use OSI standards as they become available. This is known as "intercept strategy" and we heard many views on achieving this during the conference.

Jim Brookes of the UK's SWURCC gave the universities' interpretation of this strategy. He described protocol standards as a mechanism for holding together a dispersed collection of user services. The benefits are connectivity and protection of user investment in hardware and software.

A large computing centre servicing the needs of a number of universities over a wide geographical area cannot change its mode of operation abruptly and SWURCC is seeing a gradual change from "home-grown" network protocols to full X25 International protocols using expendable gateway protocol converters.

This intercept strategy is working, but the future for this and other providers of IT facilities is going to be PABX linkages and uses for which standards do not yet exist.

This view was also expressed by Jock Houldsworth of ICL who stated that PABX and LAN must be connectable in the long term if we are to realise the advantages of voice and mixed-mode text and graphics communications. The key is probably a gateway which must let in to standard system architecture.

In many ways he considers the chip manufacturers are getting ahead of the agreed standards organisations and perhaps greater attention should be paid to these manufacturers. There is a great need to bring together the silicon chip manufacturers to ensure that the standards agreed are actually implemented correctly.

The OSI standards themselves and where we have got to in their implementation were described by Bill McCrum of the department of communications, Ottawa. He defined open systems interconnection as "a concept whereby information processing systems may communicate without needless constraints engendered by equipment choice".

The achievement of openness in systems interconnection demands that many fundamental components of information technology and the computer network be structured around these standards and he left no doubt in the delegates' minds that this is a top priority for all present-day inter-networking activity.

One of the most sophisticated open networking systems available at the present time is Project Universe, an imaginative concept involving co-operation between GEC-Marconi; Logica; British Telecom; the Science and Education Research Council; Cambridge, Loughborough and London Universities. It is funded at a current level of £3 million from the Department of Trade and Industry over 1981-1984.

KUO . . . *"Reward is technology leadership."*

BROOKES . . . *"Protocol standards are a mechanism for holding together a dispersed collection of user services."*

Chris Adams of SERC described the basic components of the Universe network and some of the communication experiments currently being carried out with it. This is a big WAN/LAN project, involving satellite communications via an orbital test satellite (OTS).

Unlike many other systems described at the meeting of the Universe network is a packet switching system which uses "lightweight" protocols, considerably simpler than the X25 protocols used in the inter-university network. They enable data to be transmitted via "virtual circuits".

These virtual circuits do not have error-recovery of flow-control imposed by the network. Instead it is left to the end-user to arrange these management functions. An advantage claimed for this method is that widely different applications such as packed voice, slow scan television and file transfer can be handled fairly efficiently and this may be important in future add-on services for IT communications.

In a session on message handling, chaired by Doug Steedman of Bell-Northern, Canada, the importance of a growing area of IT, namely voice, video and mail traffic, became apparent.

In his own organisation considerable use is being made of high quality print transmission, text, digital facsimile and mixed-mode data. He claimed that message handling was one of the earliest applications for OSI and that the specifications proposed originally by IFIP have been taken up and incorporated by CCITT in its now internationally agreed standards.

He stressed that message handling in IT is for people and that suitable directory information and distribution lists must be available addressed by attributes and not be means of an identification number or code.

An interesting insight into message handling for another large organisation the French Societe Internationol de Telecommunications Aeronautiques (SITA), was given by Georges Giraudbit.

He referred to the "telematics revolution" which has affected many business organisations through the progressive introduction of videotext, teletext, telefax and teleconferencing where the worldwide availability of low-cost data communication has made possible the international deployment of data networks and satellite systems. These are likely to induce lasting changes in human activities of similar importance to the introduction of computers.


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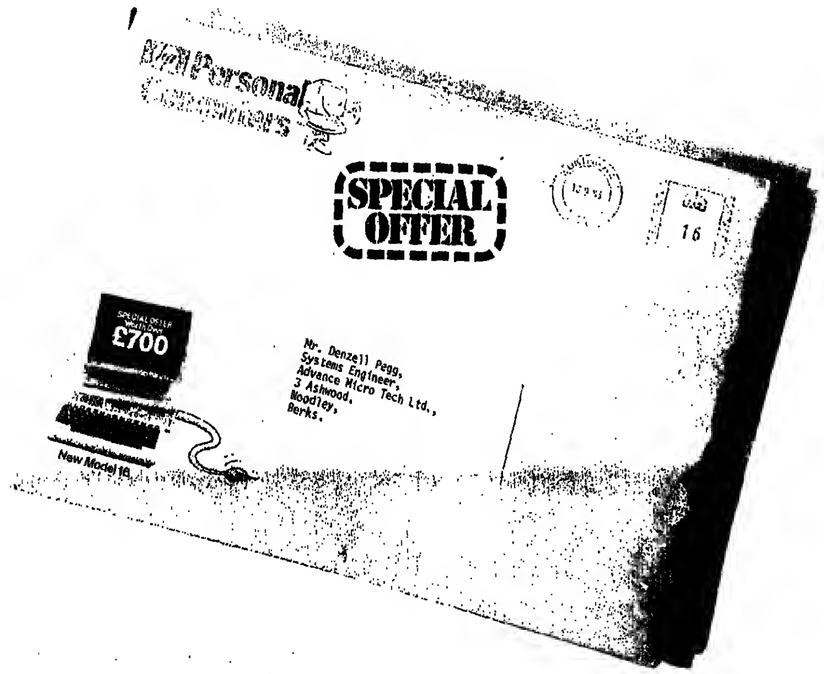


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**BOOKS**

## Gamblers who influenced industry

**Grammatical Man, Information Entrophy, Language and Life. Jeremy Cambell. Allan Lane. Penguin. £12.95.**

ONE of the better things about the computer industry, someone once said to me, is that it has more lunatics per square foot than most industries have per square mile. The still better point is that the two people most influeotial on the theories which underpin the industry, were both gamblers – a fact neatly brought into context by Jeremy Cambell.

Claude Shannon, father of information theory and a major contributor to the mathematical concepts that underlie most of the communication structures in machines, virtually gave up his work to dabble on the Stock Exchange, testing his own theories of randomness.

John Von Neumann, the other great theoretician of the early computer age, was a poker player.

What united Shannon, Von Neumann, Escher, Godel, ancient figures like Aristotle – and some not so ancient, like the linguist Chomsky – was a theory about language and information.

Put in its somewhat oversimplified form, each of those figures, often in different ways and about different topics, conceived of the world as animated by a deep structure, which worked from within to create not order, but variety.

Variety, because its appearance in the natural order is a macroscopic defeat of the law of entrophy, is a significant feature of information itself, according to Cambell.

**Kevin Cahill**

## Feel the way through the Fifth Generation

**Towards Fifth Generation Computers. G. L. Simons. The National Computing Cente. £10.50.**

THE Fifth Generation: the Threat, the Promise, the Sequel, the Film and now, The Fifth Generation Strikes Back.

After IBM, the now ubiquitous Japanese project to obtain precisely 37% of the market in information technology by 1990 must be about the most overwritten topic in the industry.

Having said that, it also, just like IBM, remains one of the most opaque topics too.

The volume of copy and the endless flow of ink have left almost everyone, including one often suspects, the Japanese themselves, thoroughly in the dark as to what the project will produce by way of computers.

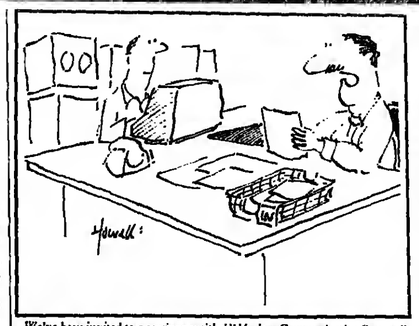
Geoff Simons' book is not so much a light in the darkness, therefore, but more a kind of guide to the all encompassing gloom.

As such, it is going to be valuable to anyone who, through either choice or neccessity, has got to attempt to understand just what the Fifth Generation project might (the stress in on "might") be about.

Apart from that, it won't shed much more than indirect torchlight on what the men from the land of the rising sun are actually trying to build.

Simons just offers a simple and thorough guide to all that's been said so far – a limited goal, clearly accomplished.

**Kevin Cahill**



*We've been invited to a seminar entitled "Modern Communication Systems" which was held last week.*

## Are computers alive?

**Are Computers Alive? Geoff Simons. Harvester Press.**

GEOFF Simons certainly has a way with words. To support his view that computers are alive he states that a computer can be said to be suffering from mental disease if it "behaves oddly", that computers have reproducive systems because they can build other computers and that they can see and think.

He argues that a computer can beat an oak tree at chess, weld better than a frog and is "at least as clever as a cactus". As a result, his book, Are Computers Alive?, is one to be frightened by or to scoff at.

Simons' arguments are powerful, because he describes computers mainly in human terms, with little reference to the humans driving them. Words like touch, see, understand and think are used liberally in describing robots and computers.

Simons is chief editor at the National Computing Centre. It is surprising to find such an eminent person using language in this almost dishonest way. Animals only have hands, he says, but "robots have developed to exploit a wide range of manipulative methods".

In other places Simons brings in science fiction in such a way that it appears to be reality of future possibility purely because it is written by respected authors.

The book considers what life is, then looks at the "anatomy", "behaviour" and "psychology" of computers.

Towards the end, Simons takes his arguments to the logical conclusion by considering the emotions and rights of computers. And he closes with some questions raised by the idea of living machines: can a computer stand for parliament and would you let your daughter marry one?

The arguments are chilling for the believer and interesting for the neo-believer. Even the scoffers will find this a fascinating work.

**John Kavanagh**

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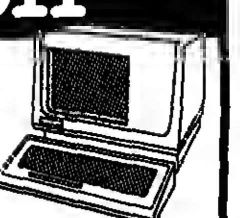

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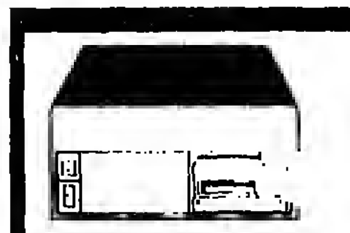

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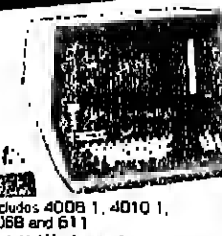

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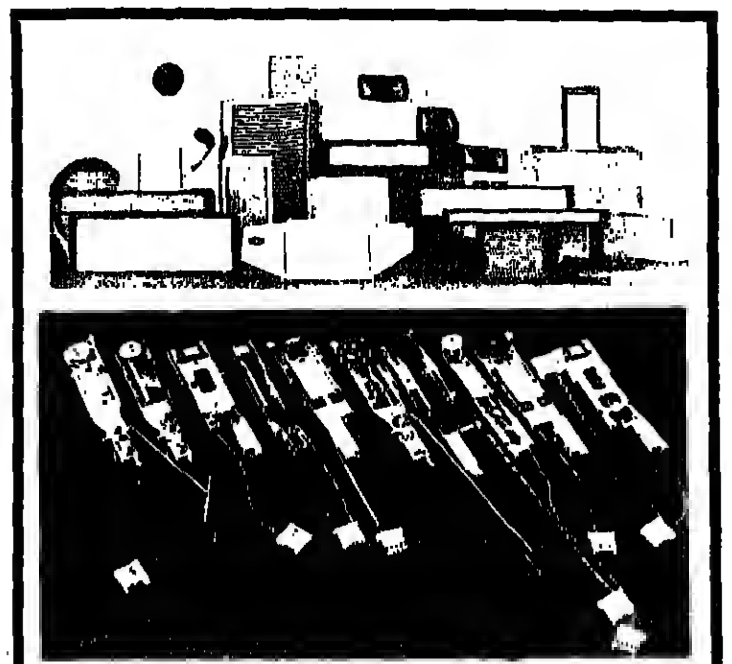

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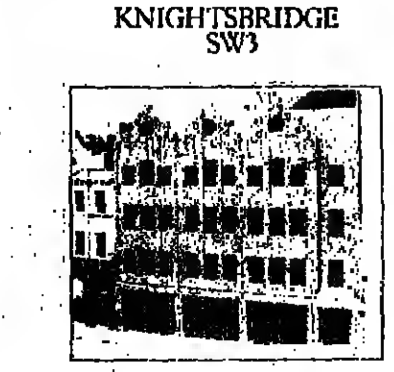

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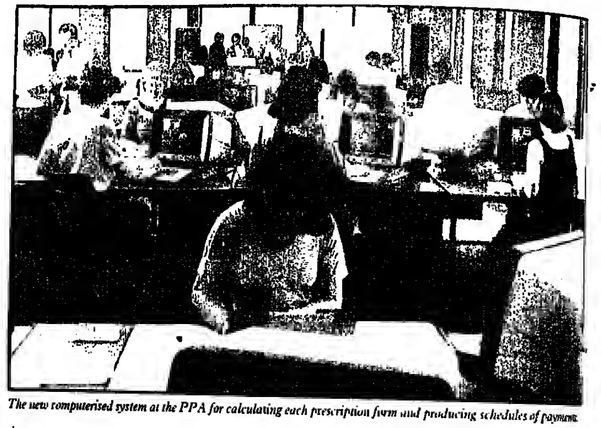
DATA ENTRY

**One of the biggest key-to-disc set-ups in the UK is being implemented at the PPA, which deals with 330 million prescriptions a year . . . Nicholas Enticknap reports on a complex system, facilitated by batch data entry**

# Just the prescription for chemists' headache



*The new computerised system at the PPA for calculating each prescription form and producing schedules of payment.*

ALMOST since the dawn of the computer age, there has been strenuous debate between those who want computers to be as easy to use as possible and those who argue that technical efficiency necessitates a certain degree of complexity.

Probably the first practical application of this argument was over assembler versus high level languages: its most recent appearance has been in the discussions of Apple Computer's new Lisa office system, which carries the ease-of-use principle on personal computers much farther than anyone else has yet dared to attempt.

For the average computer professional, the question most often occurs when considering interactive against batch data entry.

To judge from much that is written in the Press, you might think that this question was resolved about 15 years ago – that batch data entry is as outmoded as the biplane and that nobody in their right mind would consider anything but interactive data entry for any new application.

This is not at all the case: batch data entry continues to be substantially the most cost-effective solution for many applications in many organisations. An illustration of this point is provided by the Prescription Pricing Authority (PPA).

The work of the PPA is not widely known: it's unsensational, so gets little publicity. For most of us, when given a prescription by our doctor or dentist, it is a matter of going to the nearest chemist, paying the fee (unless exempt), and taking the tablets or whatever, and that's the end of the matter.

For the chemist, however, there is the small matter of payment to be considered. The average cost of each prescription, taking into account the drugs themselves, the dispensing fee and the chemist's overheads, is £4, so the prescription charge, much though it has risen over the past five years, doesn't remotely cover it. In any event, some 70% of all prescriptions are exempt from fees, because the patient is a child, a pensioner, unemployed or on supplementary benefit.

When you take this into account, prescription fees cover only 10% of the chemists' costs, and that leaves the country's pharmacies collectively over £1 billion out of pocket.

This is where the Prescription Pricing Authority comes in. The organisation is a part of the National Health Service (though it is much older than its parent body, having been set up before the First World War by Lloyd George). Its job is to receive every prescription form tendered to any pharmacy in England, to calculate the value of each, and to produce schedules of payments to the chemists.

In terms of paperwork, that is a formidable task. Currently about 330 million prescriptions are issued a year. Each has to be accurately deciphered, checked for a variety of conditions, and priced. There are about 19,000 different types of drug, each with its own price, and to complicate matters further many of them come in more than one pack size.

Pricing is a very skilled clerical task, according to Eddie Arthurs, computing services officer at the PPA. "Many of the pricing staff have A-levels and a few even have degrees. It takes around two and a half years for a pricer to reach full proficiency."

The complexity of the work is such that it has been done on a totally manual basis until recently. The pricing system worked to the satisfaction of all concerned, so there was no pressure for any change.

The statistical analyses were less comprehensive than the Authority would have liked, but the cost of producing them was very high – 130 people were employed just sorting, collating and tabulating the results. Even with this complement of staff, the PPA was able to produce detailed analyses of drugs prescribed for only 1,800 doctors a month (out of an English total of 25,000).

The report appeared some six months after the event, by which time the doctor might well have forgotten the particular circumstances of his practice at the time.

It was to improve this situation that computers were finally adopted, though the decision was made almost by accident. The major spur to action occurred in the mid-70s when the school leaving age was raised from 15 to 16. The PPA has a high turnover of staff and has always relied heavily on a regular intake of school leavers each year. In 1975, that did not materialise. As a result, the Authority started to fall behind with its pricing workload and that prompted an official investigation into its methods of working.

A top-level consultant (R. I. Tricker, director of the Oxford Centre for Management Studies) was called in to assess the situation and recommended methods for improving the processing of information. He produced a detailed report in 1977. The pricing operation came out of it with high marks for efficiency, but computerisation was recommended to improve the exploitation of information.

A major question in the planning stage that followed concerned the method of entering data to the computer system. How much data should be input? Should the prices continue to be calculated manually, or should the drug names and packet sizes be input only, with the prices calculated by reference to a look up table?

Analysis showed that the bulk of the job was deciding what to enter rather than the data entry task itself, and the computerisation of the pricing function, therefore, was simply not cost-effective.

A series of data entry system trials were then undertaken. Three types of system were evaluated: an OCR system, an interactive menu-driven system and a key-to-disc system.

The OCR system required chemists to stick bar-coded labels on the prescription forms, which was time-consuming in itself and prone to error, and the method was quickly discarded as not being productive enough.

The other two systems produced comparable results for a time, but as the trials wore on the key-to-disc system started to show greater and greater productivity.

"This is because of the nature of the application," said Arthurs. "The pricing clerks rely heavily on their memories after a time: for most prescriptions, they don't have to look up the prices, but just write them on. We also found the interactive system to be less helpful as a training aid than we expected – the biggest factor in the job is the ability to read and interpret the forms."

The trial eventually provided conclusive evidence that key-to-disc was the most cost-effective data entry method. Rediffusion Computers emerged from a selection process involving 25 companies as the supplier of the initial system. The company has also provided the PPA with an audio-visual training package, developed by education services consultant Brenda Wa[illegible] ing operators how to enter da into the system.

An idea of the thoroughgoi nature of the trials can be gaine from one of its minor findings: t was decided to modify the ke boards so that each had fo enabling the entry of the numbe 30, 60 and 100 with just one ke stroke. These numbers are th most common packet sizes fo tablets, with about a half of a prescriptions being for one of th three. The Authority calculate that, as a result of cutting the da entry task required for thes numbers from either two or thre keystrokes down to one, it would save £1 million a year.

With similar thinking, a speci set of numeric code numbers h been devised for the most comm drugs, different from those all ated by the NHS. These a numbered so that the commones drugs of all, such as disulfiram, have a one digit number (plu check digit), the slightly less com mon have two, and so on down th

**The most common 3,000 drugs, which account for 96% of all prescriptions, have been allocated numbers that are converted into their appropriate NHS codes after entry to the mainframe. By this means the average keying requirement for each drug identifier has been cut from five alphabetic characters to three-and-a-half numeric characters**

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At the time of writing, ICL Rediffusion Computers' R3[illegible] system has been installed. The configuration includes one megabyte of main memory, 133Mbyte Winchester disc, tape drive, line printer and communications facilities. Eight similar systems are on order.

That might seem an enormous amount of data entry capacity, but it will only serve two of the PPA's 11 processing divisions.

The implementation of computing will not be complete until late 1986, by which time the PPA will have 36 key-to-disc systems supporting, in all, some 140 workstations. The data produced by these systems will be processed on some four or five different mainframes.

When the implementation is completed, the PPA will have one of the biggest key-to-disc set-ups in the UK.

Anyone who still needs convincing that batch data entry is still very much alive and kicking need look no further for an ideal illustration of how to tackle a complex


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## LEGAL DATABASES

**Emergent countries are unable to put their legal materials in writing. Charles Christian examines the feasibility of storing them on computers instead**

# Keeping the laws of the Commonwealth

WITHIN the next few weeks, the Commonwealth Secretariat, based at Marlborough House, London, will be commencing a study of the potential for computerisation of legal materials and the use of database retrieval systems by lawyers in developing countries.

The study is going to be carried out by the secretariat's legal division and comes as a direct result of talks that took place earlier this year at the Commonwealth Law Ministers' Meeting in Sri Lanka.

The topic of the computerisation of legal materials was first broached by Commonwealth countries at the 1980 Law Ministers' Meeting in Barbados, when delegates from Canada and Barbados both presented papers on the subject.

At that time the costs of computer technology were relatively high and so, although there was "a lively discussion", much of the debate was concerned with the more general, theoretical benefits that information retrieval services could offer the legal profession.

By 1983, however, the position had changed quite substantially. Much of the initial education work had already been done and the lawyers of the Commonwealth had successfully been sold the idea of computer assisted law retrieval (CALR) systems.

The costs of computer equipment had fallen quite dramatically; and a number of commercial organisations had established electronic legal databases and were marketing competitive CALR systems.

From the point of view of Third World countries, computerisation might provide the only answer to their problem of establishing a thriving legal profession and systems of justice.

The essence of any legal system is a readily available permanent record of all the laws currently in force at any one time. This means not only having copies of legislative acts and statutes, but also in "common law" countries (which include the UK and most of the Commonwealth), having a record of the judges' arguments and decisions in all "leading cases", establishing precedents and points of law.

If this were not enough already, you also need commentaries on the laws for the benefit of practitioners, and text books for the benefit of students.

Now in England and Wales – which for legal purposes are a separate jurisdiction from the rest of the UK – there is a well-established and fairly sophisticated, conventional legal publishing system in existence. But even that is having to price books and law reports at ruinously expensive prices.

**There are worries that the cost will lead to a harmful division between rich practices and poor**

For smaller jurisdictions, however, such as Scotland, the position is far worse. The economics of preparing, printing and publishing law books for such a narrow market is making the whole operation no longer viable.

How much worse, then, is the problem for some of the emergent nations of the Commonwealth, which, until recently, relied almost entirely upon the facilities of the old imperial "mother country" for their legal publishing.

Perhaps the most ominous example of the type of problems that can arise comes from one of the small Pacific island-states.

Recently, at considerable expense and with the assistance of a UNESCO grant, the island hired a team of legal academics to write up all that country's law.

Once this task was completed, the island's government investigated the possibility of having the manuscript published in book form. The cost, it was discovered, would have taken up a considerable proportion of the annual income of every individual on the island.

Consequently, the project had to be scrapped and to this day the only comprehensive copy of the island's law is the researchers' original manuscript.

There is, therefore, a possibility that in some parts of the world the tradition of the laws of the land as a body of written documents is in danger of dying out.

That is where CALR systems enter the picture. A number of countries – the first was Canada – have been quick to spot that text captured in magnetic form once could aid the legislative drafting process by expediting the production of successive drafts as they were required (by elementary word processing techniques).

Moreover, it could also create a final copy of the text, which would be suitable for subsequent information retrieval from a computerised law database.

The 1980 Law Ministers' Meeting concluded computerisation could mean that the legal systems of developing nations were "on the verge of a new era".

But this optimism was tempered at both the Barbados and Sri Lanka meetings by a note of caution, which, for convenience, can be divided into "practical" and "jurisprudential" objections.

On the practical level, it was pointed out by the Barbados delegates that if you are going to put all your legal eggs in one computerised basket, it is essential that you have sufficiently reliable technology to support your databases.

In Western countries air conditioned computer rooms are taken for granted, but in equatorial Africa, with far greater temperatures and humidities to cope with, the problems are totally different.

Another problem is international telecommunications, which would have to be of an excellent standard if, for example, your country is linked into one of the US CALR systems such as LEXIS, based in Ohio.

If, as some countries are doing, you opt for a domestic CALR system, it is vital that the country should have a reliable electricity supply network, so that databases are not degraded by spikes or power cuts.

The significance of this last point was made all too clearly at the Sri Lanka meeting when one of the formal state receptions was plunged into darkness by a power failure for over an hour.

Possibly the most prickly problem countries are likely to face, however, concerns the jurisprudential objections to CALR systems. These were discussed in some depth in Sri Lanka, following papers by the federal government of Australia and Professor Colin Campbell of Queens University, Belfast.

Many of the points they raised appear to have no immediate solution, and it is these issues that the Commonwealth Secretariat hopes to be able to tackle.

For example, should governments opt to develop a unified system under their own direct control? Is this tantamount to "reinventing the wheel", when it would be better to leave it in the hands of commercial organisations than risk a proliferation of competing but incompatible systems?

Then there is the question of whether commercial organisations would establish and exploit what in some cases would be a monopoly situation, forcing users to hire grossly expensive dedicated terminals and charging lawyers exorbitant fees for access to vital databases.

There are worries that the cost of CALR systems will lead to a harmful division in the legal professions of the world between the rich practices that can afford all the latest devices and their poorer brethren, who would only be able to supply a second-rate service.

Finally, there has been a lot of concern expressed about the issue of the "national sovereignty" of legal data. Many countries, through lack of resources and expertise, would be unable to establish CALR systems themselves and so would have to rely upon the services of a foreign provider.

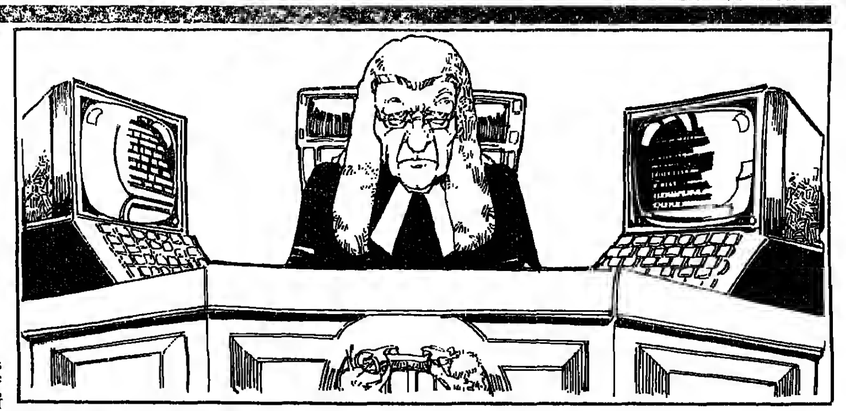
Is it desirable, however, that a country should not have the only comprehensive record of the law of their land located in their own territory and under their own control?

As Professor Campbell pointed out at the Sri Lanka meeting, the computerisation of the law has opened up "a whole can of worms" – a can placed firmly in the lap of the Commonwealth Secretariat to do something with.

## LITIGATION

# Is IBM adding the insult?

**Bob Djurdjevic looks at the motives behind IBM's courtroom activities**



IT SEEMS unlikely the title of a 19th century novel, *Crime and Punishment*, by Dostoyevsky, should befit a contemporary legal battle between warring computer companies. Yet IBM's latest escalation in its court proceedings against Hitachi and its American partners raises new questions about crime and punishment.

The point has been made that crime doesn't pay. If a company attempts to gain unfair market advantage by stealing a competitor's trade secrets, the culprit and employees punished.

Federal Judge Spencer Williams saw to it that justice was done when he sentenced Tom Yoshida, president of NCL Data Inc of Santa Clara, CA, in June of this year to two years probation and a $7,500 fine for helping Hitachi acquire stolen IBM trade secrets.

In February of this year, Hitachi and two of its employees pleaded guilty to the conspiracy charge in the indictment. The Japanese computer and electronics company was fined $10,000 – the maximum fine possible under the law.

The two employees were sentenced to five and two years' probation, and fined $10,000 and $4,000 respectively. Charges against two other Hitachi employees were dismissed in April.

The two National Advanced Systems engineers, also involved in the affair, were summarily dismissed by the company.

Yoshida's sentencing concludes the Justice Department's case against Hitachi and its employees who remained in the US to face the charges.

Adding to the legal carnage left in the wake of this case, Hitachi reportedly also cut the salaries of several of its senior executives earlier this year. Among the executives who suffered this humiliation were Hitachi's chairman, Hirokicki Yoshiyama, and the company's president, Katsushige Mita.

The case, labelled "Japanscam" by the press, has received almost as much publicity in the trade press as the Watergate scandal did in its time in the daily media. Such adverse publicity added public embarrassment to the court fines of the defendants.

In September 1982, IBM launched civil lawsuits against Hitachi, National Semiconductor Corp, and its subsidiary National Advanced Systems (NAS). IBM charged the three defendants engaged in "unfair business practices" when they allegedly tried to "misappropriate" confidential IBM product information.

IBM's legal action helped rekindle media and public interest.

In November 1982, Hitachi and NAS agreed to turn over the allegedly stolen documents and allow IBM to conduct its own discovery to find out how NAS gained possession of the secret material. The stipulation was that the parties would try to settle out of court.

On the defensive – and under pressure – NAS president, Floyd Kvamme, resigned late last year for what he called personal reasons, amid speculation by some observers that the IBM case may have been a factor in the timing of his decision to leave.

In March of this year, NAS new president, Dave Martin, said he expected a settlement with IBM "within 30 days".

But this was not to be. Last April, IBM announced that the settlement couldn't be reached and court proceedings would resume.

The above is a summary of the 14-month-long confrontation between the FBI and IBM, representing the injured party, and Hitachi, NAS and Mitsubishi Electric Corp, in the roles of offenders. Most offenders have been punished. Some even humiliated.

But that does not seem to satisfy IBM. In the latest attempt to escalate the civil lawsuit against National Semiconductor, NAS and Hitachi, IBM recently filed court documents alleging the defendants top officials – not just the two NAS ex-employees – knew about and used allegedly stolen IBM confidential technical manuals.

"At least a dozen" NAS employees, including its senior management, took part in this process, according to IBM's latest charges. That means at least 10 NAS executives may have been involved.

If true, such business practices by NAS executives are indeed deplorable and worthy of severe punishment. Yet IBM failed to name any of them, thus smearing many innocent people's reputations by inference.

This makes the onlooker wonder about IBM's motives in escalating the case. Has this affair become a marketing, rather than a legal contest?

An IBM spokesman at first said he did not think the company was after a monetary compensation.

Later, he corrected that by citing a 10-point document filed in the court by IBM early in August, seeking that the defendants be required, among other things, to refrain from using the stolen technology in their products, return to IBM all of its confidential documents, and vow to not engage in such activities again.

IBM also asked the court to assess its damages – trebled – as well as award it punitive damages, court costs and reasonable legal fees.

An NAS spokesman volunteered some information to IBM during its negotiations for an out-of-court settlement. It is possible that IBM is using some of that information now, many months later, to escalate the charges.

If this is true, additional questions of business ethics may arise, this time with IBM as a culprit.

Although lying low, Hitachi is not quite ready to play dead. Last month the company filed a countersuit against IBM in a Tokyo court, claiming IBM had no right to stop Hitachi from any of its design, development or manufacturing efforts.

IBM's recent escalation of the US lawsuit may well have been prompted, in part, by Hitachi's legal action in Japan.

The IBM motion, filed in the US Federal court in San Francisco on August 8, asked the judge to enjoin Hitachi from carrying out its Japanese suit, and to advance the trial date.

IBM's sudden haste to get to the trial may well be a sign the company is having second thoughts about this prolonged litigation, especially now that Hitachi is fighting back with its own battery of lawyers. But, the only thing certain at this point is that everybody's lawyers will be kept busy.

At the same time that the legal battle between IBM and NAS was escalating, the Central Bank in Oakland ironically became the hundredth customer for the Hitachi-made AS/9000 mainframe – just a year and a few months after the first customer shipment.

The first 100 AS/9000 customers included many highly respected Fortune 500 companies, as well as government agencies. About 50% of the AS/9000 installations represent new accounts for the plug-compatible vendor.

As a result of NAS's sales success, the company's financial picture has also improved, with revenues for the year ending May 31 exceeding $300 million.

Yet, following the publication of IBM's renewed legal efforts in this case, National Semiconductor stock fell 1.5 points (3%) in one day, at a time when the Dow Jones index rose 8.44 points!

However, the relative success of both rivals obscures the question of how much better NAS would have done had it not been for the IBM lawsuit.

In the short term, IBM's courtroom tactics seem to have been effective.

But by pursuing the legal battle with such vigour, IBM may be tipping us off about its secret fears. Is the company admitting NAS and Hitachi are a real threat as competitors?

Even the American public may soon start to question if adding insult to injury can be called exemplary behaviour by one of the world's most admired corporations.

*Bob Djurjevic is computer industry analyst; president of Annex Research; and publisher/editor of the Annex Computer Report.*


Now it's possible to build a spreadsheet, generate a pie chart, change the pie chart to a bar graph, edit the memo, add a free hand drawing, and then get an exact print out of the whole thing with one hand tied behind your back.

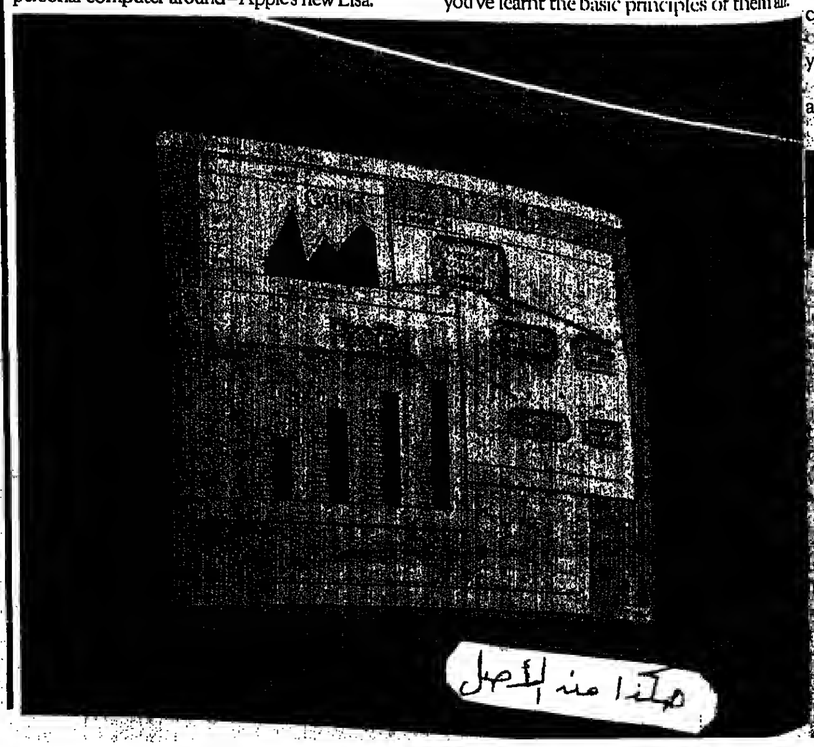
Everyone works by using tools to shape information drawn from different sources.

Putting together a report, for example, by taking facts from one document and figures from another. Using a calculator to isolate trends. Drawing graphs to show an overall picture.

Now you can do all that using the most powerful personal computer around–Apple's new Lisa.

So powerful that six essential business tools are built-in and totally integrated – for numerical analysis, word-processing, filing, graphics, illustration and project management. And yet so simple to use that you can cut information from one program and paste it into another with one hand.

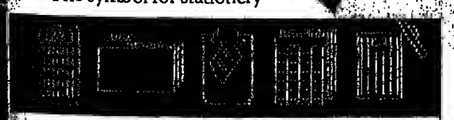
And once you've learnt to use one program you've learnt the basic principles of them all.



THE MAGIC OF A MOUSE.

Lisa is incredibly fast to work with because of a clever desk-top device called a "mouse." By moving it you move the cursor on the screen, pointing to the function you want to employ. Click the mouse while the cursor is over the symbol of the function and Lisa gives you instant access to it.

Lisa's functions are clearly and simply represented by symbols. The symbol for stationery looks like a piece of stationery. Files look like files; a clipboard like a clipboard.



Lisa works with desk-top symbols you already know. If you want to use a file, point to the symbol of the file and–presto!–you've got it!

There is a calculator and a wastebasket too: all are at your service at a move of the mouse.

Later, Apple Net will give you communications through an in-tray and an out-tray (on your Lisa screen of course). Lisa Terminal lets you open windows, to fill with information from another computer for analysis.

NO PERSONAL COMPUTER HAS EVER BEEN THIS POWERFUL.

For people who want to run tailored programs, Lisa runs BASIC, PASCAL and COBOL high level languages.

Hardware includes a 1 megabyte microprocessor main memory and 1.7 megabytes of built-in storage on two floppy disks.

Lets you "cut and paste" everything from spreadsheets to business to word processing–at the same time.

A 5 megabyte ProFile hard disk storage allows all Lisa applications to be stored on one disk. A high-resolution screen makes Lisa graphics very special.

Lisa's dot matrix printer (160 x 144 dots per inch) features proportional spacing with bold, italics, or underlined characters. And Lisa lets you print in any one of 11 different type styles.

The same high level graphics you get on the screen you get on the printer.

YOU'VE GOT TO SEE IT TO BELIEVE IT.

To see how revolutionary Lisa is to work with, you've got to work with it.

Fill in the coupon below and we'll arrange a demonstration. And you'll see why, although you can use it with one hand tied behind your back, Lisa will untie your hands.

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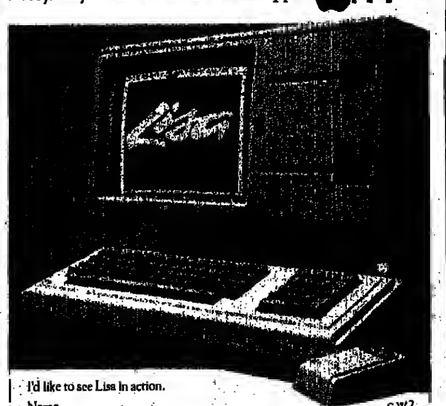

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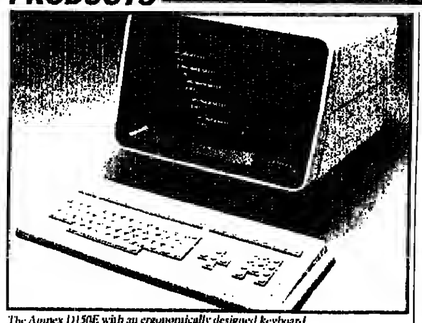
## PRODUCTS



*The Ampex D150E with an ergonomically designed keyboard.*

# Ampex designs a terminal for Europe

AMPEX Corp is extending its family of video display terminals with the D150E, a low-cost editing terminal that has an ergonomically designed keyboard for the European market.

Like the current D125, D150 and D175 versions, the latest Ampex terminal emulates 20 models made by six other terminal manufacturers. Its design uses the latest available integrated circuits, which reduce component count by 50%, giving increased reliability and lower manufacturing cost.

Announcing the D150E Bob Trick, marketing manager of Ampex International's Europe, Middle East, Africa area, said: "Ampex has developed the D150E in direct response to the needs of some of our European customers who require the fully ergonomic keyboard which features 30mm linme row heighr and 8 degree slope.

"The Ampex terminal offers a choice of amber or green colour screens as well as eight national character sets (available by menu set-up)."

Ampex designed the new model D150E using the latest keyboard technology. The 16 single-stroke function keys (32 with shift) are programmable from either the host computer sr the keyboard. The keys are sculptured and have pre-set spring pressures (70 grams for normal keys snd 100 grams for the function/edit keys). Up to 5 LEDs can be added to the keyboard to identify special operating modes.

Ampex International (CW) Acre Road, Reading, Berks RG2 0QR.

# I/O boards expand Alpha systems

ALPHA MICRO has introduced tws new input/output component boards designed to expsnd the capabilities of Alpha Micro systems.

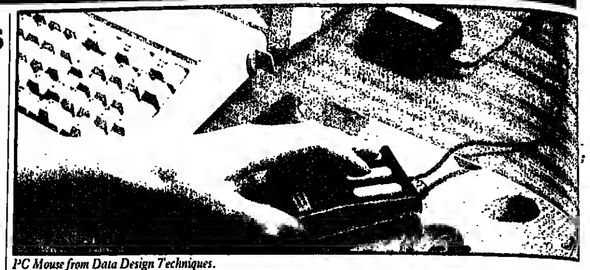
The AM-1003 is a multi-function board designed specifically fsr Alpha Micro's AM-1000 desk-tsp model microcomputer. It features four serial ports and one parallel port, allnwing the system to support up in seven users as well as a printer. The standard AM-1000 contains three serial I/O ports.

At the user's option, the AM-1003 csn also be used to run CP/M, the microcomputer operating system now offered by Alpha Micro, or Alpha RJE, the company's communications option which allows the system to "talk" with other Alpha Micro systems sr other msnufacturers' systems which use IBM's bisynchronous 2780/3780 protocols.

When either CP/M or Alpha RJE are in use, the system will support two terminals, which means thar for the first time, CP/M may be called up from any terminal connected to the system.

The AM-330, a data communicaions controller, is a multi-function I/O board designed fsr use with Alpha Micro S-100 bus-based systems.

Alpha Microsystems (GB) (CW), Berkshire House, 56 Herschel Street, Slough, Berks SL1 1PY Tel: Slough 821922.



*PC Mouse from Data Design Techniques.*

# PC friendly with the Mouse

PC MOUSE from Data Design Techniques is said by the makers to add a new dimension in user-friendliness to the IBM Personal Computer.

It eliminates many of the laborious cursor and keyboard csntrol operations allswing the businessman to concentrate on using the computer rather than wasting time learning complex keybssrd csntrol sequences and how to be a typist, says Data Design Techniques.

PC Mouse is a compact hand-held device which translates movement over a desk-top pad into movement of the screen cursor. Pointing to a given screen character in this way is faster than using the keyboard.

Click-buttons on the PC Mnuse can be used to replace sequences nf up to 15 keyboard strokes. There are three buttons, and clicking each one, two or three times initiates three 15-stroke keyboard sequences per button. Thus the user hss a total of nine sequences nf 15 keystrokes to call on without having tu touch the PC keyboard. This can be a boon to the non-typist – nut having tu fumble around with the keyboard nr having to remember complex control sequences, says Data Design Techniques.

Once keystroke sequences have been set up for a partic program, they are retained in of that program and reloaded the Mouse each time the progr is used.

PC Mnuse is ready to run wi all popular programs such VisiCalc and Wurdstar.

For software developers, DE offers the MouseWindow packa

Data Design Techniques (C 68/70 Tewin Road, Welwyn G den City, Herts AL7 1BB. Te

*Father and son venture at Croton Acoustics.*

# The silent approach

WITH EEC regulations limiting maximum printer noise coming into force next year, s new company has been launched specialising in up-market printer silencers.

Crown Acoustics, a joint venture between father and son, does not intend to rely on percentage noise reduction claims and subjective listening tests to prove the worth of its silencers. Instead it has invested in decibel meters as part of the demonstration kits.

"Most printers emit noise of 80dB and up", Brian Crown commented. "The new EEC regulations define an upper limit of 55dB and subjectivity has no place in determining whether a printer conforms to a precise figure. As far as we are concerned there is only one way to be objective, and that is quantitative measurement using a decibel meter. Then you can really see what sort of a job s printer silencer is doing".

Product confidence is also reflected in the company's philosophy on loan demonstration units. For larger users, say ten and up, Crown Acoustics is willing to loan s unit on s week's free trial. Thus the prospective purchaser has time to see how effective the silencer is (perhaps even alongside a competitive product).

The Crown Acoustics range includes over 250 desk-top and floor-standing models covering most available printers. All are fan cooled.

The objection raised hy some users that silencers make it awkward for operators is overcome by proper space design and the use nf double "memory" hinges for the lid.

The lid is made of clear or smoked-finish Plexiglas.

Crown Acoustics (CW), 55a Chigwell Road, South Woodford, London E18. Tel: 01-989 9096/7.

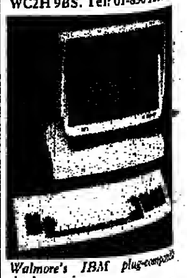
# IBM plug compatible stations

WALMORE Electronics has introduced display stations which are plug-to-plug compatible and interchangeable with the IBM 3278 and 3178 display stations. These terminals can be used with S/370, 43XX and 30XX processors and 8100 information systems.

Coaxial cables connect the display stations directly to the IBM 3274 and 3276 control units and to the 4331 processor.

The ergonomic design features user-adjustable screen positioning with tilt and swivel of 120 degrees to either side, a low-profile, lightweight and moveable keyboard and a green, non-glare screen in a cubiner hood to protect the viewing area from direct light. Standard features include an audible alarm and 87 keys with 7 program functions.

Walmore Electronics (CW), 11-15 Betterton Street, Londo WC2H 9BS. Tel: 01-836 1228.



*Walmore's IBM plug-compatible display station.*

*The P2000 shredder.*

# Security risk solution

UNWANTED computer printout, reports, outdated designs and other documents can be a security risk if they get into the wrong hands.

DNCS says it can offer a fully portable and easy to use machine to solve this problem, for £380.

The P2000 paper shredder can be carried safely and its light weight design enables it to be used in any situation where a 13 amp plug is available.

The rugged cutters accept paper clips and staples, allowing reports to be shredded with confidence.

DNCS (CW), West Croft Industrial Estate, Manchester Old Road, Rhodes, Middleton, Greater Manchester M24 4PJ.

# Telexes sent direct from the typewriter

TELEXMAN is a telex machine from Data Transfer Systems offering unattended automatic dialling and 24-hour retry. It gives distributed message switching facilities for under £4,000, and allows the user to interconnect multiple typewriters, word processors, personal computers and other terminals from a variety of different manufacturers.

Telexes may be sent completely automatically from anywhere in the office, although supervisor or operator intervention is still available if required. Input may be office typewriters, as well as word processors, VDUs, Microtype portable terminals and electronic handwriting pads.

Once the message is complete, the typewriter or word processor is left free for its normal tasks. It is not tied up as an online terminal, and the primary functions of the word processor are therefore not degraded. No software or hardware modification is necessary. Telexman plugs directly into existing communications ports. All stations may be used simultaneously.

Telex is less expensive than telephone and faster than post, but still under-utilised by many companies. One of the reasons is that telex has not previously been easily accessible, says Data Transfer Systems.

Of the total time taken to prepare and send a telex message it is estimated that over 90% is taken up in preparing, carrying and trying to get through to the distant end. Telexman reduces this cycle.

Some of the features provided by Telexman include: Store and forward (messages may be stored and sent at a later time); 24-hour automatic retry (automatically dials difficult-to-get numbers even when staff have gone home); abbreviated codes (no need to enter the full number); directory (for frequently used numbers); broadcast (the same message can be broadcast to a group of destinations, even automatically adding the contacts named).

Telexman, says Data Transfer Systems, extends the reach of office automation by networking existing office typewriters and word processors. Telex lines are used more effectively, so fewer lines are needed. Savings are made on line rentals and associated costs such as transmission charges, staff salaries etc; operator time is saved as retyping and manual repetitive dialling is eliminated and incoming messages no longer cause interruption.

Data Transfer Systems (CW), Market House, Market Road, Richmond, Surrey TW9 4NG. Tel: 01-878 7702.

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# 41 Mbytes on 8in Winchester drive

MICRO Technology, represented in the UK by Unit-C has developed two DEC-compatible Winchester controllers that emulate the DEC RL01/RL02 disc drives, but with the fully optimised storage capacity of standard Winchester disc drives.

The MLV11 provides 41.6 megabytes of storage on a single 8in Winchester drive. The MLV11M provides 20.8 megabytes of storage on a single 5¼in Winchester drive, or 41.6 megabytes when multiple drives are used.

An innovation in recording techniques has made it possible to overcome the storage capacity loss of other emulators that interface Winchester drives with DEC equipment.

Both the MLV11 and MLV11M are totally compatible with DEC hardware and software and are designed for use with Q-bus computers. Both controllers can be interfaced with single or multiple drives, and both are dual-height, single board controllers requiring less space and power than larger, less sophisticated systems.

The MLV11 and MLV11M feature user-selectable media defect mapping, transparent error correction hardware, and an internal crystal-stabilised phase-locked loop to assure complete data integrity.

Both new controllers plug directly in the Q-bus backplane, making the changeover from RL01/RL02 drives to greater capacity Winchester drives an easy operation, says Unit C.

Unit C (CW), Dominion Way, West Broadwater, Worthing, West Sussex. Tel: (0903) 212171.



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HEWLETT PACKARD

## EUROPEAN PRESS

**A widely-held belief is that the trade Press across the Channel is academic beyond reason, its editorial diet intelligible only to professors . . . Jeremy Woolfe puts the record straight**

# Exploding the myths that still cling to the computer Press

A UK software engineer was English, had worked on a contract basis in and around London for seven years and was currently engaged by the Société Générale Belgian bank as part of a team in Brussels, updating the bank's cash dispensing system.

He knew his job well, earned a generous remuneration and read *Computer Weekly*. I asked him what he thought of the computer Press in continental Europe.

"What Press? Is there one?" he asked.

Unfortunately, this epitomises the management that should know better.

The opinion is not only totally false, but it is also rather damaging. It often results in extremely feeble use of a potentially powerful communications tool – the continental computer Press – that is potentially available to the UK computer industry, wishing to export to its largest and closest export markets, ie the markets in Europe.

The truth of the matter is that the computer Press in Europe does exist and is powerful. Yes, it is true that some publications are highly dull. You know the sort of thing: typesetting is by typewriter. And printing apparently takes place on a day when ink is in short supply.

There are no good pictures, but each third paragraph is followed by a mathematical equation. The author, professor or engineer, works full time at some unknown university and probably does not leave it very often.

But these publications are quite untypical. The computer Press in Europe can accurately be described as vigorous, prolific, professional, fast developing, varied and serious. At times it can even be slightly unnsing. It is often clever. It is certainly read and respected.

Many publications meet this description. In deciding exactly how many, it is difficult to know where to draw the line around what precisely is a computer publication.

A country like Germany, say, might have a good 10 mainline weeklies and monthlies given over entirely to the world of computing.

Continuing with the example of Germany, there are rather more than another 10 publications dealing with automation and instrumentation and at least 15 devoted to electronics.

And all this is quite apart from the general industrial Press, which also takes the computer industry seriously, carrying regular non-specialised articles on computer applications and so on.

Of course, this profusion should not be surprising when you think for a bit. Germany's population of 61½ million is over 5½ million more than that of the UK and comparable GNP is higher. Also, Germans are notably avid readers of almost anything.

Reference to some of the important computer publications in Germany gives an insight into the overall picture. The three that I've chosen are *Computerwoche*, the equivalent of *Computer Weekly*, a large circulation newspaper format weekly; *Computer Zeitung*, a computer newspaper not very different but fortnightly; and an exceptionally lively monthly magazine published in Cologne and called *Online*.

The reaction of *Computerwoche* editor Manfred Hasenbeck, speaking in his office in Munich, to the accusation of Germany publishing only academic material is worth hearing.

"Seventy per cent of our readers are DP managers, decision makers and end users, 10% are consultants and the remaining 20% are in the computer manufacturing industry. Therefore, our editorial has to include many very practical articles aimed especially at computer users," he says.

Hasenbeck could easily add that a print run of 30,000 copies an issue could hardly be supported if the contents were not clearly and articulately presented.

When you turn to the monthly magazine, you find that the cover on a recent issue of *Online* goes on to support the case that the computer Press is bright and imaginative.

This cover, picked more or less at random, shows in bright colours and startlingly vivid graphic terms a pair of hands struggling with a rubic cube.

Above, in a cartoon-style speech bubble, are the words "Softmix nervt!" (mixed software languages get on your nerves). The style of the design is pop-art and when you turn to the inside of the magazine you find contents that are clearly presented, well balanced and businesslike.

In the absence of ebullient editor Günter Sandscieper, deputy editor Horst Dahmen talks about overseas orientation and the publication's special editorial sections for Austria and for German-speaking Switzerland.

But, he says, when it comes to editorial input, very little material is sent in from the UK computer industry. "Oh yes, there's one firm that sends in good stuff from time to time, but not much else."

You have to wonder why. Could it be that Germany is too far away? But is this really justified, when its nearest town to the UK is roughly the same distance away as Newcastle is from London?

In any case, the "distance" argument can hardly apply to France – that large chunk of land only 21 miles offshore from Kent.

**Sometimes the smaller countries appear to be more dynamic per head of population then some of their neighbours. The Netherlands and Belgium bear this out. Both countries are determined to maintain high technologies in industry**

France's population of 54 million, as we should be aware, takes its own computer industry with the utmost seriousness. It has to – on government orders!

As in Germany and elsewhere, the ultra-academic publications do exist in France, but you have to look for them. What hits you first are such publications as the news weekly *OI-Hebdo* (or OI-Weekly) and its only slightly more profound monthly stablemate *OI-Mensuel* (or OI-Monthly), and many others. The computer field here is one of effervescent vigour.

Jean-Marc Chabanas, editor of both *OIs*, says that the newspaper format weekly prints 50,000 copies a time, 6,000 of which sell direct to the public in newspaper kiosks on the streets, in railway stations, etc.

The majority of readers, 70%, count as "computer users", with 20% coming in the category "software" and 10% from manufacturing. A strong "situations vacant" advertising column helps keep the circulation high.

Do the *OIs* have an academic approach? "Perhaps just a little, as far as the monthly is concerned," says Chabanas. "Here we often use outside writers to get the reaction of computer users to statements put out by manufacturers.

"As for the weekly, editorial reaction has to be more immediate."

It should be noted that the weekly also carries special pages of interest in French-speaking Switzerland and in Belgium, and goes to the trouble of printing some matter in Flemish to suit the northern part of Belgium.

Flipping through a recent issue, you see articles on people, products, a discussion on a robot at work in the all-important French food industry, an analysis of some personal computers and, finally, 20 solid pages of job adverts.

Overall, 80% of the contents originate from within France, with much of the outside material coming from the US. The UK's contribution is around 5% Chabanas thinks.

This publication group obviously takes news "abroad" seriously. It has permanent correspondents in both the US and the UK, who control practically all the news from the "Anglo-Saxon" countries.

In other words, British industry does not even have to step across the sea to make its liaison with an important European publications nerve centre. This case is, of course, rare.

But just because the *OI* group is strong, do not be misled into thinking that the group has a monopoly in France. In fact, the pattern is much the same as in Germany.

Picking from a chance pile on the bookshelf I came across a 190-page colour magazine called *Mesures, Regulation Automatisme*, which has a heavy emphasis on measure, *Le Nouvel Automatisme*, an issue of *Bureau Gestion*, which concentrates mainly on office micros, and *Minis and Micros*. A more comprehensive pile might also include *La Press Infonnatique, Bureau et Informatique* and *Informatique et Gestion*.

These publications tend to fall into two main groups. There are the mainly monochrome newspaper-style publications and the glossy covered *House and Garden* style magazines. At least this is how one computer Briton abroad, Dr Colin Jackson, expresses the general situation.

Jackson, from the Butler Cox consultancy, is an unusual example of someone quite ready to criticise Europe's computer Press, "but not for being academic!" he explodes.

"They are not learned journals at all. If anything, mundane, but it obviously varies from country to country.

"In my view what they need is more in-depth writing," he says.

"Sometimes the smaller countries appear to be more dynamic per head of population than some of their neighbours. In the world of computer publications, the Netherlands and Belgium bear this out.

Both countries, the former with 14 million people and the latter nearly 10 million, are determined to maintain high technologies in industry. High technology means computers and computers mean, among other things, people, reading and writing about computers.

In Holland this writing is in the national language of Dutch – not English, as some British companies would appear to think. The same applies to Northern, ie Flemish, Belgium.

Altogether, there are about 20 million Dutch speakers in Europe, making it nearly half as important as English is in Europe.

Because of the common Dutch language in Holland and Flanders, there is quite an overlap of Dutch and Flemish publications from one country to the next. Probably the strongest two single publications are the Amsterdam-based fortnightly, *Computable*, and its similar weekly newsprint rival, *De Automatisering Gids*, also of the Netherlands.

Both are newsy-looking publications with high circulations. Both give wide coverage to all aspects of the computer industry and both are highly respected.

However, where you've finished with those two publications, you certainly have not finished with the Dutch computer press. There is also a rather technical review, *Informatie*, which sells about 19,000 copies an issue.

There is also *Micromix*, a monthly, newly born this year, but already putting out 32,000 copies a time. Considering the country's population, it has almost achieved mass circulation newspaper status.

Editor of *Micromix*, Joost Boswyk, outlines his publisher's policy: "Our aim is to satisfy first-time users. We seek to give non-technical readers, such as you'd find in small businesses, information for professional use on the subject of microcomputers.

"We aim to show them what you can do with the machines, not how they work."

*Micromix* would appear to be an important platform from which to address an affluent audience. So, a certain user does with his XYZ computer, Rudell says.

He laments lack of journalistic titles to carry out duties properly, but, despite this crudeness, he's doing a bad job at all. In a local-ions contest between a handful of computer papers in Belgium, *Data News* has already reached a strong position after only three years.

But what about news from British industry? Usually it is sent to him in English, he comments flatly. Sometimes it comes in French, but rarely never in Dutch.

This editor of a widely read computer magazine would certainly welcome competently written material from Ferranti, Plessey, Sinclair and, no doubt, numerous other British computer companies with interesting developments, but they send out very little editorial.

While this comment comes from one publication, it probably applies to the others, *BAIB*, and *Paninformatique*.

To be fair, Rudell's complaint is not echoed everywhere. Where

**The editor of a highly read computer magazine would welcome competently written material from Ferranti, Plessey, Sinclair and other British companies with interesting developments, but they send out very little editorial**

remembering the 20 million Dutch speakers in Europe, does Boswyk receive much of his press release material from the UK in the Dutch language?

"Only very rarely," is his immediate answer. He can only recall ICL as being a good exception, and that's because the material comes straight from ICL's apparently switched-on Dutch subsidiary.

If the European computer Press generally divides into the newsprint and the glossies, there is one that seeks to bridge the gap, and that is *Data News* in Belgium.

*Data News*, which has editions in both French and Dutch, has a large newspaper format, coloured covers, but not much colour inside. Editor Paul Rudell himself a Fleming, describes the content.

On one page there might be an article on a new integrated circuit. British company has a large European subsidiary – for example Ferranti in Germany – it appears that PR professionals are on hand locally to supply the right kind of ammunition.

But where the subsidiary is medium or small, any reasonably professional editorial hardly stands a chance.

Furthermore, when it comes to the smaller British firms employing monolingual PR consultancies in the UK for their communications and selling via hard-nosed distributors on the Continent, dialogue with the marketplace via the technical press editorial columns is usually pathetic.

From the point of view of British exports, this is a shame.

*Jeremy Woolfe is a freelance journalist/public relations man in Brussels who works with computer affairs*




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Computer Weekly and Software* will be sponsoring both the exhibition and the prestigious conference, running at the same time, guaranteeing a high level of interest in both events.

Inevitably, top quality business visitors will be drawn to such a show, with DP professionals, dealers, OEM's and serious business and professional end-users all visiting the exhibition with nothing but software purchase at the forefront of their minds.

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**software '84**
EXHIBITION AND CONFERENCE

PRODUCTS

# Philips first with 'tele-newspaper'

CLAIMED to be the world's first "tele-newspaper" TV has been launched on to the UK market by Philips.

The CS3890 is a 26in colour television with a miniature built-in printer which, at the touch of a button, provides a paper copy of any teletext page. Users can call up the share prices, road reports or a recipe and keep a handy copy for reference or further study away from the TV. It's also for home computer buffs who want to copy long, complex teleso ftware broadcasts.

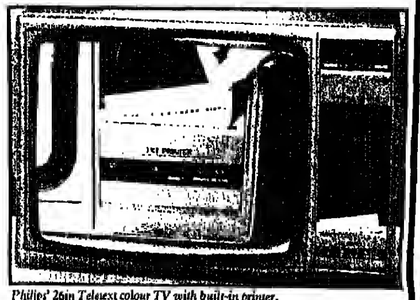
The printer is housed in a spring-loaded drawer to the right of the TV screen.

Heat-sensitive paper is used, and each page takes less than 30 seconds to print. Three paper rolls are supplied with the set, and each roll is sufficient for 175 pages.

Besides the printer, the 3890 boasts all the features of a luxury TV. Full remote control is standard (the new-style slimline handset also operates any Philips Video 2000 video recorder); there is five watts of sound output into two speakers (a 4in woofer and 2in tweeter) and a microprocessor controlled tuning system with direct access to a maximum of 90 channels.

The Philips 3890 retails for about £699 including VAT.

**Philips Video (CW), City House, 420-430 London Road, Croydon CR9 3QR. Tel: 01-689 2166.**



*Philips' 26in Teletext colour TV with built-in printer.*

*The floppy disc boxfile from Rhone-Poulenc. Prices start at £24.50.*

## New way to protect floppies

A NEW filing system for floppy discs from Rhone-Poulenc Systems is said to offer a way of protecting floppies when not in use, while still allowing fast and immediate access.

Designed for use with Rhone-Poulenc Systems' 5¼in Flexette discs, the file is a rugged plastic box which opens fully to display up to 10 floppies.

Prices for the file, which is supplied with 10 Flexettes, start at £24.50.

**Rhone-Poulenc Systems (CW), High Street, Houghton Regis, Bedfordshire LU5 5QL. Tel: (0582) 605551.**

PRODUCTS

# Personal conversion for IBM terminals

A NEW model of the Avatar universal terminal converter that transforms IBM 3278, 3178 and 3278-compatible terminals into multifunction intelligent workstations with personal computing capabilities has been introduced by ISG Data Sales.

The Avatar TC3278 is a microprocessor-based system that enables 3278/3178 terminals to retain normal functions and features for dedicated operations while adding facilities for personal computing, including local software and data storage.

The conversion enhancements offered by the Avatar are claimed by ISG to exceed substantially those recently announced by IBM, and at a significantly lower price.

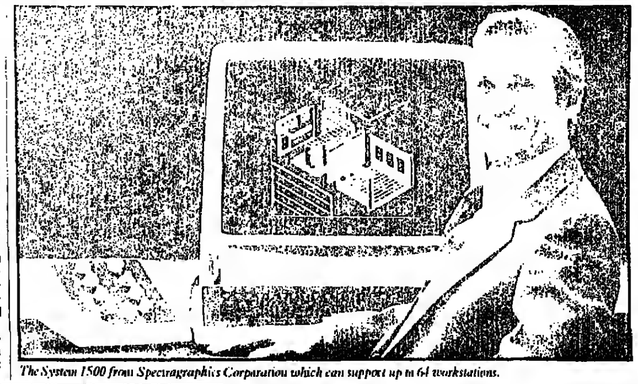
The Avatar RC3278 consists of a single board microprocessor with up to 256 Kbytes of RAM; three asynchronous serial ports for connection to non-IBM hosts, local printers and modems; and two coaxial interfaces for the 3278 and 3274/3276 cluster controller.

The system supports single or dual 5¼in floppy diskettes, for up to 1.6 Mbytes of storage, or a diskette and Winchester disc combination that offers 5, 10 or 20 Mbytes of hard disc storage.

The TC3278 comes packaged with a CP/M, CP/M-86 or MS/DOS operating system, CalcStar and WordStar application software, and a CBasic software development system. Utility packages for data transfer, file maintenance and system configuration are also included.

The Standard TC3278 system costs about £1,620, immediate delivery. But a special model is required for dual processor conversion of the IBM 3278 terminal costing about £2,225.

**ISG Data Sales (CW) Wellington Industrial Estate, Spencers Wood, Reading RG7 1AW. Tel: (0734) 884666.**



*The System 1500 from Spectragraphics Corporation which can support up to 64 workstations.*

# New concept in computer graphics

DESCRIBED as a new concept in computer graphics workstations, the System 1500 Multistation from Spectagraphics provides a range of interactive graphics features.

The controller supports from one to four workstations, and when configured with a "communications controller", the 1500 can support up to 64 workstations.

It is also offered with a choice of 32-bit parallel interfaces for IBM, Perkin-Elmer, and Digital Equipment host processors.

The System 1500 is designed to accommodate the more demanding graphics applications such as CAD/CAM, signal processing, seismic interpretation, command and control, simulation, mapping and molecular modelling.

Prices for the System 1500 controllers start at $21,900. Up to four workstations can be added to the controller.

**Spectragraphics Corp (CW), 10260 Sorrento Valley Road, San Diego, California 92121.**

*Data Type's XK19 high resolution graphics terminal.*

# 19in screen graphics

A LOW-COST graphics display terminal with a 19in screen, announced by Data Type, is the latest addition to the Data Type AutoGraph family, and will cost from £3,750 with deliveries starting in the next two months.

The XK19 is aimed at the CAD/CAM market where, says Alan Richardson, sales manager for Data Type, a 19in screen has now become "the standard for design applications".

Data Type has also introduced joystick and bit pad input for the XK19 and the other AutoGraph graphics terminals.

The XK19 provides the same 1024×780 viewing window as the Tektronix 4014 terminals, on a long-persistence, P-39 green phosphor tube. The terminal's 1024×1024 image memory format provides "square" pixel spacing for "screen dump" output printing on the new generation of matrix printers. The user can choose between green-on-black or black-on-green displays.

The XK19 features on-board intelligence for drawing circles, arcs, ellipses, and in-fill for blank areas.

**Data Type International (CW) 104 Llantarnam Industrial Park, Cwmbran, Gwent NP44 3YP. Tel: (06333) 69162.**

# Streaming for DEC LSI-11 users

DEC LSI-11 users can have the same tape streaming facilities as mini and mainframe users with the new tape cartridge subsystem available from Midlectron Systems. The LSI-50 can store up to 44 Mbytes and is fully compatible with the LSI-11.

Its 22-bit addressing capability makes it upward compatible with the new 11/23+ systems.

The subsystem consists of an LSI-50 controller – a single quad board – and a CDC Sentinel streaming cartridge tape drive which uses ¼in cartridge tape.

A full range of operating systems including RT-11, RSX-11, RSTS and Xenix are supported. The LSI also provides file-orientated back-up/restore operations under standard DEC utilities such as Pip, Filex, Bru, Dup, Copy, DSC and Preserve.

Functionally emulating the DEC TM-11 tape system, the LSI-50 not only provides back-up but also serves as spooling storage or a means of loading programs.

A 32 Kbyte "relaxation" buffer allows overlapped I/O with disc activity without requiring specialised programming.

**Midlectron Ltd, (CW), Midlectron House, Nottingham Road, Belper, Derby DE5 1JG Tel: (077382) 6811.**

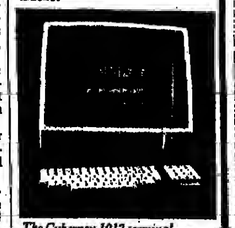
# Terminal offers high resolution

A MONOCHROME graphics terminal which is claimed to offer high resolution at low cost has been introduced to the UK by Brent-Cybernex.

It provides emulation of the Tektronix 4010/4012 graphics terminals and Tektronix Plot 10 graphics package, featuring a full 1024×1024 resolution (1024×780 displayable).

Raster-scan operation is employed for reliability, which is further enhanced by the 1012 terminal's a reduced parts count.

**Brent-Cybernex (CW) Sovereign House, Dallow Road, Luton, Beds LU1 1TP Tel: (0582) 452028.**



*The Cybernex 1012 terminal.*

# Seismic software package

GOULD Electronics is offering a comprehensive seismic data software package, to be operated on the Gould IP8500 or IP8400 image processing systems.

The Seismic Workstation Software features interactive computer graphics efficiency in the handling of seismic exploration and modelling data. It allows users, says Gould, to view and manipulate data more rapidly than through conventional methods.

The package is a low-cost, yet fully functional utility level foundation to which proprietary software can rapidly be added.

**Gould (CW), 1870 Lundy Ave, San Jose, California 95131. Tel: (408) 263-7155.**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# Floppy disc library case

A UK-built floppy disc library case claimed to be superior to US rivals has been introduced by DRG Business Machines.

The case, a one-piece plastic moulding, is said to be easier to open than competitors.

Three standard colours are available: blue, black and beige. Special colours can be provided to meet customers' specific needs on big orders.

Initially the cases are for 5¼-inch discs only. An 8in version will be available soon.

**DRG Business Machines (CW), 13-14 Lynx Crescent, Winterstoke Road, Weston-super-Mare, Avon BS24 9DN. Tel: (0934) 415398.**

# Data logging device

A DATA drive from Quality Systems International, called the QS121, is a dual magnetic cartridge system designed to communicate with the host computer through a standard RS232 interface.

The command repertoire includes read/write/copy/delete/rename/back-up/verify for sequential file handling and read/write/copy blocks of 256 bytes, for random processing and directory housekeeping.

The one-off end-user price is £795, excluding VAT.

**Quality Systems International, (CW), Imperial House, 108-110 New Walk, Leicester LE1 7EA. Tel: (0533) 543553.**

# APPOINTMENTS

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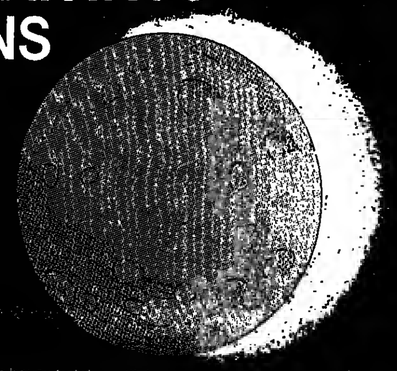

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## COMPUTING CO-ORDINATOR

The Institute has a vacancy for a Computing Co-ordinator at its Edinburgh offices where a PRIME 250 computer is operated on behalf of the Department of Energy as a satellite of a master installation in London and where a Data Base related to geological and geophysical exploration of the UK Continental Shelf is currently being installed.

The successful candidate will be responsible to the Head of Unit for:—

1. Operational management of the PRIME computer and associated peripherals, including digitising and plotting facilities.
2. Supervision of contract Computer Programmers and operators.
3. Management of IGS digitising staff.
4. Completion of new programs and development of existing programs, particularly those relevant to the Unit's digitising work.
5. Preparation of computing resource estimates for future developments and implementation of approved proposals.
6. Co-ordination of the work programme with the Data Manager of the Hydrocarbons Unit and close collaboration with the Department of Energy's staff.

Applicants should have a post-graduate degree in a relevant subject and at least 5 years' computing experience.

The successful candidate will join at Senior Scientific Officer level (£6,870-£11,476 p.a.).

NERC is not a government department but conditions of service are similar to those of the Civil Service.

For further details and an application form, write to: General Administration (Recruitment), Institute of Geological Sciences, Nicker Hill, Keyworth, Nottingham NG12 5GG.

Closing date for receipt of completed application forms is 30 September 1983

Please quote reference SS/HC/EO/1.

**NATURAL ENVIRONMENT RESEARCH COUNCIL**

154B7

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SCOTT WILSON KIRKPATRICK & PARTNERS

## COMPUTER PROGRAMMER

We are a major firm of internationally operating consultant civil and structural engineers and transportation planners. We require a programmer to join our in-house computing section.

The candidate must have an HNC/H Tec qualification and at least one year's experience in Fortran programming. He/She will be involved in the development and maintenance of computer aided design and draughting software.

Candidates must be willing to travel overseas for short or long terms if required. DEC, VAX and graphics experience would be an advantage.

We offer flexible working hours, lunchaon vouchers, group health scheme and a salary dependent on experience.

**For application form please write to or phone: Miss Deborah Pond, Scott Wilson Kirkpatrick & Partners, Scott House, Basing View, Basingstoke, Hants RG21 2JG. Tel: Basingstoke (0256) 61161.**

(B97)

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## SYSTEMS SUPPORT SERVICES LTD.

**Station House
Harrow Road, Wembley
Middlesex HA9 6DB
01-903 9648**

Computer Weekly apologises to Systems Support Services Ltd., for the omission of their address and telephone in last week's issue of Computer Weekly. For permanent vacancies please see their ad on page 72

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## Programming - with a difference.

At Hambro Life we have a refreshingly different view of what application programmers should be doing.

We think they should be more than just coders. We believe a strong technical Programming Department is essential for the design and implementation of the computer systems which are so central to the administration of our business.

**As a result of this philosophy we are building an extremely strong and professional Programming Department which offers unlimited growth to programmers wishing to build technical careers.**

Central to our applications software development is the use we make of IBM's database management system IMS - for example we have a network of logically related databases consisting of over 70 million segments. (Our IBM 3081 runs with 3380 discs using Xerox laser printers.)

But Programming at Hambro Life is also different because the company's different. Not content with its position as the country's largest unit-linked life company, and one of the top 100 companies in the U.K., it is now embarking on a programme of diversification and expansion that offers growth opportunities for everyone.

All this activity means that we need more high-quality programmers to join our young professional team. We need people at a variety of levels, with salaries ranging from:

**£12500 up to £15000 plus car**

We are looking for people with at least 4 years solid application programming experience, preferably in an IBM PL/1 environment (but we frequently retrain COBOL users).

Starting salary will naturally depend on your experience, ability and potential. In addition, our first-class benefits package includes non-contributory pension, profit-sharing and share option schemes, free life cover, BUPA, and generous assistance with moving to this attractive part of the country.

Send now for our explanatory Progamming booklet and an application form, or phone **Linda Hobbs on Swindon 46700.**

Please send me your Programming booklet and an application form.

Name_____
Address_____
_____
CW15/9

Post to: **Linda Hobbs, Hambro Life Assurance plc, Hambro Life Centre, Swindon, Wilts. SN1 1EL.**

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---

## Join the Digital Research performance growth path

At Newbury and at £20,000 plus.

Digital Research is the world leader in its field. It sets the industry standard, on both sides of the Atlantic, in the design, development and marketing of operating systems, languages and graphics software for microcomputers.

Its Northern European Marketing Operation, based at Newbury, is entering a key phase, with massively increasing sales throughout its territory and product launches imminent for a number of further breakthrough developments in software technology.

It therefore needs to expand its sales and support teams by adding the three people for whom you see job specifications on the right.

Digital Research combines one of the highest growth rates in the industry with one of the lowest staff turnover rates.

Your career opportunities with the Company would be exceptional.

The age group envisioned is 25-35 and the key word is energy. In each case, a degree level education should be part of the applicant's background.

Gross salary, commission and bonus (where appropriate) for each of the three posts will exceed £20,000. Plus 2-litre car, BUPA, pension, life insurance and relocation expenses.

Please apply, with curriculum vitae and in writing only, to:

**Secretary to the Director, Northern European Operations, Digital Research (UK) Limited, Oxford House, Oxford Street, Newbury, Berkshire RG13 1JB.**

DIGITAL RESEARCH
The creators of CP/M™

### DISTRIBUTOR SALES MANAGER

A man or woman who is already experienced in the sale of computer software to the distributor and is now ready to assume responsibility for the marketing and sales of all DR products via distributors throughout Northern Europe.

You will be participating in perhaps the most exciting ever development in consumer orientated software mass marketing, and with the market leader.

An aggressive and innovative personality is needed to implement new marketing programmes and convert them into hard sales.

### OEM SALES REPRESENTATIVE

An experienced software sales individual who will be responsible for penetrating existing accounts with new CP/M products and with an emphasis on the development of new business.

You will be a strong personality with an in-depth knowledge of our marketplace and the ability to negotiate contracts at the six figure level with UK microcomputer manufacturers.

You will be joining a team that is driving the microcomputer industry through unprecedented advances in CP/M software technology.

### SOFTWARE CONSULTANT

A professional with a thorough understanding of language compilers and a working knowledge of real-time multitasking operating systems.

Your qualifications will be of the highest calibre.

The ability to present complex ideas with clarity and authority is essential. You will be involved in negotiation and consultation at all levels with client companies.

A strong bias towards systems languages, especially C, will be a distinct advantage, together with a familiarity of Digital Research's product lines.

154B9

## PROGRAMMER COBOL — to £9,000

An opportunity has occurred for a Programmer with a South London organisation utilising VAX 11/780 for the development of large database systems. They require around two years' commercial applications experience using any structured COBOL, VAX COBOL being especially welcome. Flexi-time working, bonus and cheap pension scheme go to complete the company package.

## ALL LEVELS ICL 2900 — to £11,000

A rapidly expanding Essex-based company has requirements for Analysts and Programmers through to Team Leader status. ICL experience which may include VME exposure is particularly relevant and at senior levels proven analysis or supervisory skills are necessary. Handling a large volume of the London insurance market, our client would especially welcome financial and insurance applications backgrounds. Benefits include profit share schemes and excellent promotion prospects.

## ANALYST/PROGS & PROJECT LEADER — to £15,000

Vacancies occur at various levels for persons with good BASIC, BASIC+, FORTRAN or similar programming backgrounds, preferably backed by working experience in a DEC environment. A proven project exposure involving the building of software for banking systems, data communications or message switching applications is desired as our client has a heavy commitment for development and support in all three areas. An attractive salary range, reviewed at six monthly intervals, supplemented by a generous company benefits package is offered.

## ANALYSTS ICL 2966 — to £12,000

A major manufacturing company, based in Hampshire, utilising ICL 2966 under VME is seeking several Analysts to augment its development teams. A commercial or financial applications background is required and exposure to ICL hardware is desirable. Every opportunity for advancement is available to Analysts with two or more years' experience within this market leading company.

## ANALYST/PROGS BURROUGHS — to £11,500

C. London company is currently looking for Analyst/Programmers to join their expanding team working on a variety of financial applications. Applicants should have around three years' COBOL to include 18 months' exposure to BURROUGHS systems. Any CMS experience will be of particular interest to our client. Successful candidates will enjoy a good deal of client contact and must be professional in both appearance and attitude. Good prospects and working conditions are offered.

## SALES SUPPORT LONDON — £14,000+

Expanding company are seeking experienced DP personnel to join their sales/sales support team. Applicants will probably have spent around eight years in DP, preferably with a manufacturing or accounting applications background, together with some pre- or post-sales support exposure. They should also have feasibility study and project management experience. As well as an excellent starting salary, benefits include a company car or generous car allowance, profit share and an interesting and challenging position.

## PROG & SNR PROG HP 3000 — to £11,000

Software house with an excellent reputation in the HP market seeks a Programmer and Senior Programmer due to planned expansion. The senior position requires three years' COBOL with knowledge of IMAGE and VIEW and the junior around 18 months. This is a good opportunity to work on a variety of projects and applications and for the senior the possibility of moving into analysis at an early stage.

## ANALYSTS C. LONDON — to £15,000

We have been retained by three London-based companies to find Analysts with varying levels of experience. A sound DP background is required with exposure to pension, payroll, insurance or accounting applications. Two of the positions are particularly interesting as they offer the chance for the Analysts to work in a consultancy role with a good deal of client contact. As well as good starting salaries perks are varied and include annual bonus and mortgage subsidy.

## GSD PROG/ANALYSTS RPGII/RPGIII — £NEG

We have many clients, all SYS 34 or SYS 38 users, who have current requirements for Programmers and Analysts. Applicants should have a minimum of six months' RPG gained in a commercial environment through to three years' + for the more senior consultant positions. The companies range from banking to manufacturing and offer a wide variation of benefits.

(5441)

404 4821

**Apex Computer Recruitment Ltd.**

London Office: 59 Grays Inn Road, London WC1X 8LL. Tel: 01 404 4821.
Brussels Office: Rue Gatti de Gamond, 24, Uccle 1180 Brussels. Tel. 010 322 377 4193.

# CUSTOMER SUPPORT CONSULTANTS FOR CULLINET

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Whatever the question in computing nowadays, the answer is software. And software is Cullinet.

Cullinet, the world's leading independent software company, is growing its U.K. operation. This operation is responsible for the marketing and support of software products including, among others, database management, applications, decision support systems and personal computer software packages.

We have just moved to prestigious new offices in Stanmore and need the following people to help us grow even faster.

**Technical Support Consultants – London**

Providing day to day support for mainframe systems software products. Candidates should have at least 18 months' IBM experience with a sound working knowledge of MVS or DOS/VSE, a high level language, database management system and TP monitor.

**Field Support Consultants – London and Manchester**

Responsible for providing individual Cullinet clients with an advice and guidance service.

Candidates should have IBM mainframe experience at programming and/or systems analysis level. Knowledge of database management systems and a TP monitor is required.

**Personal Computer Software Consultant – London**

Cullinet's new range of PC software for IBM PC allows full integration of mainframe and micro applications. Applicants should have programming experience using the IBM PC with PC-DOS and be familiar with 'C'.

Please write enclosing C.V. to:
Phil Dyer, Cullinet Software Ltd.,
Cullinet House,
The Broadway, Stanmore, Middx. HA7 4DU
Telephone: 01-954 7333

Cullinet

هكذا من الأصل

# Working Together

Customer Support Specialists to £12,000 plus car.

Effective management identify the needs of its team members and ensures that they provide the correct environment for them to function and participate. Certainly, we as a computer manufacturer follow this theme through in our management style, but more particularly we recognise the need to understand our customers' business and translate this into providing complete solutions to their problems. This commitment in working together with our existing and prospective customers precipitates our need to identify experienced analysts and programmers, enthusiastic and flexible, who wish to contribute to the overall selling cycle.

Specifically you should have a COBOL or BASIC programming background and have exposure to IBM, BURROUGHS or ICL hardware. If you have previously been engaged in a supportive or training role this will be seen as an advantage – you will not necessarily be working for a manufacturer or service company currently – but you must seek the type of environment which is always stimulating, changing, and guaranteed to keep you as "busy as a bee".

Vacancies currently exist in the MIDLANDS, NORTH WEST, NORTH EAST, SOUTH WEST, SOUTH EAST and LONDON. We offer a five figure salary, company car and attractive fringe benefits.

CTA RECRUITMENT CONSULTANTS

*For further details contact our advising consultant Sheila Bradbury on 021-236 1999 (24 hour answering service) or Henley in Arden 3273 (evenings and weekends).*

**Cathy Tracey & Associates Ltd**

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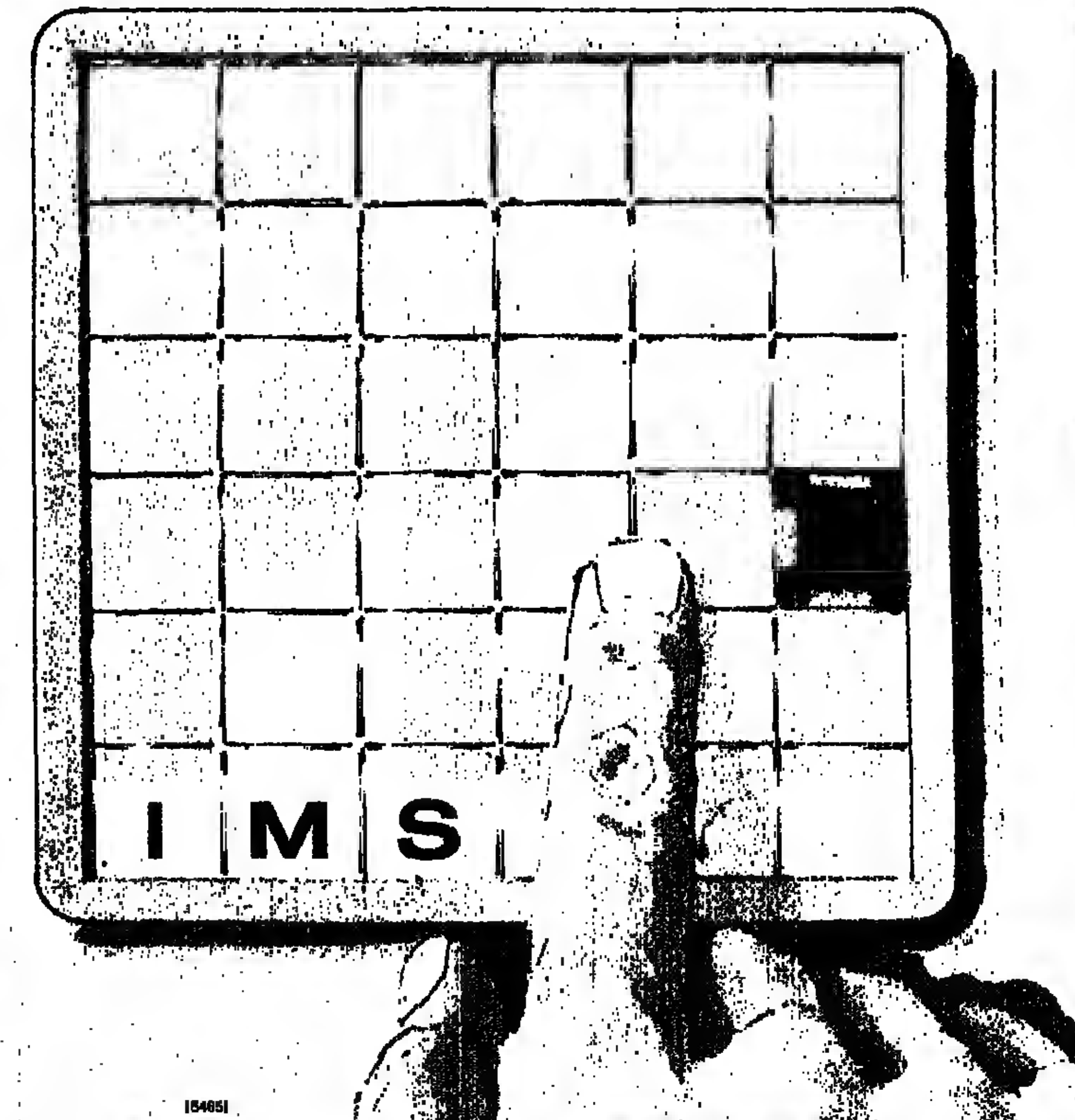
SILBURY BUSINESS CENTRE
356 SILBURY BOULEVARD
CENTRAL MILTON KEYNES MK9 2LR
TEL: 0908 604848 TELEX: 825264

# PL/1 PROBLEM SOLVERS




**If you're the kind of problem-solver we are looking for, we can promise to introduce you to some programming puzzles that will stretch your mind and imagination – not to mention your career horizons!**

**The client we will want you to meet is a professional computing group some 300 strong with ambitious plans to expand over the next few years.**

Check your experience against the following specs. . . .

**PL/1 Programmers — To £10,000 p.a.**

If you have 18 months or more experience in a maintenance and/or development environment this could be your chance to join a mainline development team. Training in IMS will be provided.

**Senior PL/1 Programmers — To £12,000 p.a.**

This is an opportunity to upgrade your career to date. The position offers the opportunity to assume both project and/or staff responsibility. The main entry requirement is a good programme development background.

**Software Group Leader — To £15,000 p.a.**
**Software Design Consultant — To £15,000 p.a.**

If you have 5 years PL/1 experience and a talent for good design in either a commercial or technical environment these positions carry with them a high level of technical management and/or consulting design responsibilities, and will provide the kind of challenge you have probably been missing!

The company is located in custom built offices in Hertfordshire approximately 30 miles out of London (commuting is possible!) and programing groups have at their disposal a wealth of computing power including AMDAHL V8, 4341, 370/158 under MVS and VM, supporting IMS and SPF.

In addition to highly competitive salaries there's a weighty benefits package including full relocation where applicable.

**Interested? Then contact Colin Hush or Jack Cowdy on 01-938 1804 office hours to 6.30 p.m. for a preliminary discussion.**

**IPP Information Processing People**

*Specialist Recruitment Consultants*
20 Kensington Church Street, London W8 4EP
Telephone 01-938 1804 Telex 22861

(54651)

## IBM

| | | | | |
|---|---|---|---|---|
| DOS | Anal/Progs | | PL1 | Surrey |
| DOS/VSE | A. P+A/Prog | CICS DL1 | COBOL | London |
| DOS/VSE | Anal/Prog | CICS | COBOL | Surrey |
| DOS/VSE | Anal/Prog | MANTIS, TOTAL/E1 | COBOL | Middx/Surrey |
| OPCX 8100 | Prog | | ASSEM | Sussex |
| OPPX | Anal/Prog | | COBOL | Various |
| MVS | Progs+A/Progs | ± IMS ± DB/DC | COBOL or PL1 | South |
| MVS | Sys Anal | FCS EPS | | Middlesex |
| OS or DOS | Ps + A/Progs | CICS ± DL1 | COBOL | Sussex+ Berks |

## IBM

| | | | | |
|---|---|---|---|---|
| OS or DOS | Prog | MANTIS | COBOL | Sussex |
| DS/DOS | Progs | CICS | PL1 | Various |
| DS/MVS | Anal/Prog | IMS DB/DC | COBOL | Herts |
| SYSTEM 34 | Prog | | RPG II | Middlesex |
| SYSTEM 38 | Prog | | RPG III | London |
| | Anal/Prog | DIALOG TSO | COBOL | London |
| | A/P + Sys Des | RAMIS | | Middlesex |
| | Sys Anal | On-line/DB Experience | | Sussex |
| | A/P or Sys Anal | Acctg Systems | | Berks |
| | Project Leader | Order Proc System | | Sussex |

## OTHER

| | | | | |
|---|---|---|---|---|
| BURR 1900 | Prog+A/Prog | DMS II | COBOL | N East |
| DEC | Prog | MASCOT | CORAL 66 | S Coast |
| DEC | Anal/Prog | | FORTRAN | Surrey |
| DEC | Anal/Prog | | MACRO II/32 | Middlesex |
| DEC | OA Software | MILITARY SYSTEMS | | Somerset |
| DEC VMS | S'ware Prog | | MACRO 32 | Various |
| DEC VAX | Anelysts | MASCOT | CORAL 66 | Dorset |
| GEC/4000 | All Skills | | CORAL 66 | Hants/Dorset |
| ICL | Anal/Prog | IDMS | COBOL | Middlesex |
| ICL | Date Anal | DDS | | London |
| ICL 2900 | As, Ps + Team Ldrs | IDMS ± TPMS | COBOL | Various |
| INTEL 8080 | Analysts | MASCOT | PDL | Wilts |
| INTEL 8080 | Lecturer | | PLM 80 | W Country |
| PRIME | Tech Specialist | | COBOL+ FORTRAN | London |
| | Sys Anal | On-line/DB Experience | | Sussex |

## INTERNATIONAL

| | | | |
|---|---|---|---|
| Designer | CAD | | W Germany |
| S/W Engineers | | VARIOUS | W Germany |
| All Skills | | VARIOUS | W Germany |

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(Previous applicants should re-apply for these positions as your applications may be out of date)

# JOIN THE ELITE

# Systems Programming

## for YOUNG GRADUATES

You're young (early twenties), have graduated in Computer Science or a relevant releted subject, and have around a yeer's experience which, perhaps, has not quite metched your expectations. You somehow don't see yourself as a super-coder with little else to offer.

Well, here's some food for thought.

The Stock Exchange provides essential information systems to its members as well es meeting an ever-increasing demand from outside organisations, and is considered to be in the forefront of viewdata technology and real-time information services.

We ere now seeking three young graduates for Information Systems Development who will work in teams involved in the programming of these real-time systems. The work is extremely varied, covering many new projects and implementation is seen after a relatively short period. Most projects include communications or detabese work.

You will be an integral part of one of these teems. However, when your task has been outlined, you will propose a strategy and will be responsible through to coding and ultimately provision of documentation.

We ere looking for good communicators with some progremming experience in a high level tenguage. If this hes involved real-time interective detebase systems and/or communication systems on minis or micros, so much the better.

Initially, the term of employment will be for e period of two years. The salery will be eround £7000, depending upon experience, with en end-of-term bonus. Additionally, the benefits include a fully-paid season ticket scheme, subsidised lunches and flextime.

Please apply with a full curriculum vitae to: Jen Ross, Personnel Officer, The Stock Exchange, Old Broad Street, London EC2N 1HP.

The Stock Exchange

*The IBM SYSTEM 34/36/38 Recruitment Specialists*

## IBM SYSTEM/34 ANALYST/PROGRAMMER

### TO £13,000 + BENEFITS

### BERKSHIRE

We are a multinational corporation engaged in the design, manufacture and marketing of electrical and electronic components and systems.

Our European headquarters is based in Berkshire and we have a worldwide annual turnover in excess of 270 million dollars. There is a System/34 based in the UK and in five of our ten European divisions. Two more are soon to be installed, one in the UK and one in our Spanish division.

Planned expansion and development is in progress and will be for the next few years. We need an experienced Analyst/Programmer to help us realise our requirements. Ability and experience in the design, programming and implementation of System/34 applications is necessary and knowledge of MAAPICS an advantage. European travel is envisaged so good communications skills coupled with diplomacy and in all instances the capacity for self motivation and hard work is needed.

Please telephone for an early informal discussion our Advising Consultant, Richard Milsum, on 01-354 1055 during office hours or on 01-958 2553 in the evenings or weekends. Alternatively please send full details to him at:

(5470)

MARCH COMPUTER RECRUITMENT

1 NOEL ROAD, LONDON N1 8HQ

01-354 1055

# —ideally with engineering or manufacturing systems experience

Our client, a major IBM user, wishes to fill the new position of Systems Project Leader in their growing Management Services Group. They are looking for someone with good all round systems development experience. Someone who has worked in an engineering or manufacturing systems environment would be a particularly suitable candidate. However, more important is the ability to cope with both systems and people in a pressurised environment.

You will probably be in the age range of 28 to 35, and have a successful track record in systems development stretching over a period of at least seven years. You will believe that you can contribute significantly to an expanding systems group and will enjoy the rewards this brings both in financial and personal terms. Although you will be joining an established team, you will be given every opportunity to make a major contribution to the continued expansion of Management Services within the company.

Our client has achieved leadership in their field by offering services that are second to none. Computing has played a major part in achieving this high standard! Their expectations are high and they are demanding employers, but the career opportunity presented is well above average and will certainly excite someone ready to move up quickly.

If you are anxious to develop your career significantly then send your curriculum vitae to A & A Consultants (Holding) Ltd, County House, 10 Little Portland Street, London W1N 5DF. Telephone 01-631 4184. Please quote Ref. No. 404.

A&A

# DALROTH

## SAUDI ARABIA

Our client, Arabian Data Systems, is running a multi-CPU configuration comprising 30XX's, 4300's with various minis and micros. Expansion of their activities has prompted the need to fill the following positions.

## £20,000-£35,000 TAX-FREE SALARIES

- ★ Accommodation
- ★ Medical Insurance Cover
- ★ Bonuses
- ★ Car Allowance, etc.

### DBMS/DATA DICTIONARY SYSTEMS CONSULTANT/PROJECT LEADER

**SALARY £25,000-£35,000**

To work with senior management on all aspects of the planning, development and implementation of an integrated Data Dictionary environment.

Applicants must have at least seven years' DP with emphasis on Systems Software and a good understanding of OS architectures and solid experience of MVS and VM, ACF/NCP and ACF/VTAM. Installation and support experience is also required of at least one TP monitor ideally COM-PLETE or CICS) and DBMS (ideally ADABAS).

### BUSINESS ANALYST INFORMATION CENTRE

**SALARY £20,000-£30,000**

To work within the User community determining the business and associated systems processes and procedures and formulating information requirements.

Applicants must be specialists in information centre tools and facilities and have extensive experience in many of the following:

VSAM, ADRS, APL STAIRS, DCF GDDM, PGF end personal micros

### SENIOR MSA ANALYST

**SALARY £20,000-£27,500**

To work as a Consultant Analyst, interfacing at Senior Management level and supporting the financial departments requirements.

Applicants must have in-depth experience of two or more of the MSA financial products/packages.

For further information please contact Jenny Dalrymple-Hay on 01-493 2947 (day) 8 a.m. to 10 p.m., or weekends Beaconsfield (04946) 4579, quoting Ref. 5007.

**DALROTH & PARTNERS LTD., 4 HALF MOON STREET, LONDON W1**

(5336)

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Ford South Africa's computer centre includes 2 B68's, 2 B69's and 2 PDP11/70 computers making up a large, nationwide on-line data communications network.

The Company is currently interviewing for:

- **Computer Systems Analysts**
- **Computer Programmers.**

In both cases preference will be given to applicants with sound training and experience.

Ford South Africa offers a highly competitive salary and the following additional benefits:

- Year end bonus, medical insurance, pension and group life assurance schemes
- Subsidised lease car scheme
- Generous assistance with travel costs and initial accommodation expenses
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If you are looking to change your lifestyle and develop your career then fill in the coupon below and post it to.

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Closing date for receipt of applications

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Address.....

.....

..... Tel .....

(5410)

Ford

## SOUTH AFRICA

Our client SIGMA MOTOR CO of South Africa require the following:

**DATABASE DESIGNERS**
**SENIOR PROGRAMMERS IBM IMS**

Preferably with the manufacturing environment experience
2 year contracts, flights paid, housing, sterling payment and many other benefits
Interviews shortly
Contact: Technicon International Management Services Ltd, 811 High Road, London N12 01-445 0922

(5418)

## Software Specialist c. £12K

Timex have achieved rapid success in high-volume consumer based electronics — they lead the home computer market in volume production — through technologically advanced development and manufacturing programmes. With major financial re-investment and further new products to be on-stream shortly, they require a Software Specialist to grow with them.

Reporting to the Chief Electronics Engineer you will be the software kingpin in design and development — supervising and advising on all software activities as a project team member. With an R & D or Design and Development background, you should be of graduate status, capable of working with Z80 assembler code. BASIC and/or FORTRAN an advantage.

Considerable experience within volume electronics assembly is essential; experience of micros as applied to peripherals, an advantage.

The company also have vacancies within its Test department for graduate qualified engineers.

**Chief Test Engineer** c. £13K — to manage a team of Hardware and Software Development Engineers. High-volume electronics manufacturing experience essential as is knowledge of latest developments with A.T.E.

**Test Engineers** c. £9K — to develop equipment, determine procedures and write A.T.E. programmes. Related experience in high volume manufacturing, a distinct advantage.

**For further information on this development opportunities at Timex on Tayside please quote Consultant, Tim Doyle on 031-226 6113.**

**Hill Briton,**
**Victoria Chambers,**
**42 Frederick Street,**
**Edinburgh EH2 1EX.**

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Personnel and Recruitment Consultants

TIMEX on Tayside

ahead of its time

(5411)

## Microprocessor Engineer

c.£9,500 South East

A leading manufacturer of sugar confectionery, my clients have successfully introduced INTEL Microprocessors to their manufacturing processes over the past 5 years. If you are a Graduate Engineer with experience in Real Time Industrial and Process Control Microprocessor Systems, a challenging position awaits with a small team, engaged in keeping this company in the forefront of current technology. Please write, including full CV to Anne Jolin, PER, 5 London Road, Maidstone, Kent.

(5449)

PER Executive Selection



Systems professionals

# Even if you like it where you are, we'd like you to read this.

No matter how successful you are in your present job, there are many reasons why you should consider a move to Hambro Life.

So many, in fact, that we've spelt them out in our Systems booklet:

Once you've read it we know you'll want to be part of the exciting future at Hambro Life.

If you've been reading the Press over the last few months, you'll know that there's no where more healthy than the financial sector. **And there's no company within that sector growing, diversifying and succeeding faster or better than Hambro Life.**

Right from the beginning, computer systems have been central to our success – and with all this activity sweeping through the company, our Systems Department is expanding and developing like never before.

All of which means that we need more first-rate Systems professionals to join a team that is second to none.

The job given to you – and the salary it carries – will naturally depend on your experience, ability and potential. We have vacancies at a variety of levels, carrying salaries ranging from:

**£13,000 plus car**
(for a minimum of 4 years Solid Systems experience) up to
**£18,000 plus car.**

Because Systems feature so highly in our success, the people we recruit have to be something special.

You must be bright and clear thinking, aware of the business implications of what you do, with good communication skills and the ability to cheerfully combine pace with quality.

Your professional skills are more important to us than the languages, techniques and applications through which they were acquired, and your experience in large-scale systems and record of successful implementations will reflect the qualities we demand.

On top of salary and car, all appointments carry a first-class benefits package including non-contributory pension, profit sharing and share option schemes, free life cover and BUPA – plus generous assistance with moving to this attractive part of the country.

That's Systems at Hambro Life in a nutshell:

But if you'd like the full story, return the coupon. **Or call Linda Hobbs on Swindon (0793) 46700.**

Please send me a copy of your Systems booklet and an application form.

Name_____

Address_____

_____

CW15/9

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# COMPUVAC

## ICL 2904 and 2900 — To £12,500
Numerous vacancies at all levels for sound ICL Programming skills. Particular requirements are for VME/B skills coupled with IDMS and/or TP. Numerous opportunities in the 2904/ME29 area — again TP skills are valuable. Some requirements for S10/S25 talents also. Environments cover manufacturing, commercial and finance/banking. REF MN/CW

## HONEYWELL LEVEL 66 £ Very Negotiable
Lecturers required with sound commercial experience of large L66 Systems using DM4/TP or IDS2/TDS. Ability and willingness to teach more important than previous education experience — Sound L66 GCOS is the Criteria! REF MN/CW.

## UNIVAC — To £10,500 + Perks
ANALYST/PROGRAMMERS with Database and/or On-line skills, minimum 2 yrs. experience in commercial or manufacturing environment. Also some opportunities for people with good 1100 experience to move into finance/insurance. REF MN/CW.

## WANG PROGRAMMERS — LONDON & SOUTH EAST
Do you have 3 yrs. + WANG VS or OIS Programming experience, if so, you become applicable for the numerous vacancies we are being retained to recruit for. Our clients include Software Houses, Insurance Companies and various commercial businesses. Salaries range from £8,500-£12,000+Perks. REF SR/CW.

## H.P. 3000 PROGRAMMERS & ANALYST/PROGRAMMER — S.E. ENGLAND
If you have 2-3 years' H.P. 3000 COBOL experience with IMAGE, QUERY, VIEW & QUIZ, we have several vacancies in and around London that you would be applicable for. Salaries up to £10,000 for PROGRAMMERS, up to £12,000 for ANALYST/PROGRAMMERS. REF SR/CW.

## PRIME PROGRAMMERS and ANALYST PROGRAMMERS — LONDON
Our clients, a major Software House based in London require PROGRAMMERS and ANALYST/PROGRAMMERS with 2-4 yrs.' experience in developing commercial accounts systems in COBOL or FORTRAN on PRIME equipment. Preference given to applicants who are highly motivated with strong personalities. Salaries dependant upon experience — up to £13,000. REF SR/CW.

## ANALYST/PROGRAMMER SUSSEX — Up to £10,500
Our client, a prominent figure in the entertainments industry have an urgent requirement for an ANALYST PROGRAMMER. The successful applicant would have at least 2 yrs.' 6 mths. H.P. 3000 COBOL experience with IMAGE, QUERY, VIEW & QUIZ to work on accounts systems. Usual large company perks. REF SR/CW

## BURROUGHS PROFESSIONALS — ALL AREAS
We are still being retained by many prestigious clients to recruit BURROUGHS PROGRAMMERS, ANALYST PROGRAMMERS and SYSTEMS ANALYSTS in all areas. If you have at least 3 yrs.' experience, contact us now for more information. REF SR-CW

## IBM (JUNIOR) PROGRAMMERS — To £10,000
At least 18 months IBM programming experience and good communication skills will qualify you for a move into analysis or training in ONLINE and DATABASE techniques. Vacancies exist in all areas of London and the Home Counties. REF MB/CW.

## RPG 11 PROGRAMMERS and ANALYST/PROGRAMMERS — To £14,000
We currently require GOOD RPG2 experience for a variety of challenging positions. Opportunities include training on SYSTEM 38 or a move into international banking. REF MB/CW.

## RPG 111 PROGRAMMERS and ANALYST/PROGRAMMERS — To £18,000
One year's solid RPG 3 and a sound D.P. background preferably on GSD equipment, is sought by a number of clients. A number of vacancies exist in the SUSSEX area (full relocation expenses paid) and north of the river. REF MB/CW.

## PL/1 and/or ASSEMBLER — To £12,000
Large IBM user running MVS require PROGRAMMERS and ANALYST/PROGRAMMERS to work principally on development of new systems. 2 years' + PL/1 and/or ASSEMBLER exp. required for this Middlesex site and similar vacancies exist throughout the South-East. REF MB/CW.

## SYSTEMS PROGRAMMERS — To £16,000
SYSTEMS PROGRAMMERS with 2 years' DOS, MVS or VM Systems. Experienced candidates should have a good working knowledge of CICS together with a sound programming background using COBOL, ASSEMBLER or PL/1. REF RC/CW.

## DATABASE SPECIALISTS — £14,000-£19,000
Candidates must have a thorough knowledge of database techniques together with a sound background in DL1, IMS or ADABAS preferably gained in a Database Technical Support Group. Experience of setting up a database from feasibility through to implementation would be a distinct advantage. REF RC/CW.

## CICS PROGRAMMERS — To £13,000
2 years' experience of working on IBM mainframes under DOS/VSE, OS/VS1 or MVS Systems. A good COBOL programming background is essential as is at least 1 year of working on CICS Systems. REF RC/CW.

## SYSTEMS ANALYSTS — To £14,000
HAVE YOU GOT 2/3 YEARS' ANALYSIS EXPERIENCE? A number of clients seek ANALYSTS with experience of commercial or financial systems gained on large IBM sites. REF RC/CW.

## HONEYWELL LEVEL 64 — To c£11,000
Vacancies in N. LONDON, W. LONDON, WEST COUNTRY, THAMES VALLEY for PROGRAMMERS with sound GCOS skills, particularly TDS and IDS. Perks include Bonus Scheme, Cars etc. PROGRAMMERS with GCOS-NETWORKING TECHNICAL skills particularly sought after. REF MN/CW

## SOUTH ENGLAND — £ Excellent
Do you have experience of the following — Instrumentation, Data Acquisition, Data Communication, Systems, Display + Database Design. My company, a large well-established Software House are seeking PROGRAMMERS to SENIOR CONSULTANTS. You will be working on a variety of projects and should have experience of either CORAL 66, PASCAL RTL/2, ASSEMBLER, FORTRAN on hardware such as DEC PDP's, VAX, INTEL, H.P. Perks include BUPA, private pension, relocation package, excellent salaries and an opportunity to travel. For more information contact SHIVON.

## SENIOR SOFTWARE ANALYSTS HERTS — To £13,000
Flexible attitude and knowledge of high level block structured languages are required for positions involving occasional International Travel. You will be developing ETHERNET based office products, working on state of the art LAN technology. PERKS are excellent and there are opportunities for career advancement. REF SF/CW.

## ELECTRONICS & SOFTWARE/SYSTEMS ENGINEERS NORTH LONDON — £ Negotiable
You will be working on VAX and INTEL. Conditions include relocation assistance, 37 hour week, 6 weeks holidays, free pension and life assurance, sports and social facilities. My clients are prime contractors to the M.O.D. for electronic warfare and guided weapon systems. Due to a massive development program they are seeking personnel from an electronics/engineering background, junior or senior level, including — SOFTWARE ENGINEERS — 1 yr.+experience of software design preferably using CORAL 66. MICROWAVE ENGINEERS — 1 yr.+experience in a microwave design environment. SYSTEM ENGINEERS — 1 yr.+of mathematical modelling of digital systems. If you are looking for a challenge and opportunities to develop your career, then why not call SHIVON to discuss mutual requirements.

## SYSTEMS & PROGRAMMING MANAGER NIGERIA — £29,000 p.a.
Due to further expansion of overseas outlet, an opportunity has arisen for a SYSTEMS & PROGRAMMING MANAGER, educated to degree level, looking for a challenging and involved position to stretch already acquired technical and supervisory skills. You will be working on DEC PDP 11, RT11/CTS300, equipment, using DIBOL, in an international organisation, and be actively involved in systems analysis and programming with emphasis on user contact and the management and training of staff. Accommodation is provided for single or married status. REF JH/CW.

## PROGRAMMERS TO PROJECT LEADER LEVEL BERKS & ESSEX — £7,000-£13,000
BERKS: VAX experience preferred (PDP 11 BASIC+background considered. VAX-COBOL will retrain to VAX-BASIC). You will be involved with teams developing commercial and financial systems. Project Leaders will be in charge of teams of up to eight staff and European travel is required.
ESSEX: Two major organisations require DEC PDP 11 Programmers, Analyst Programmers and Project Leaders. One company has Project Teams of up to six people developing Insurance Systems on PDP 11/60's and 11/70's under RSTS/E using BASIC + / + 2. The second company will retrain any DEC PDP language used in a commercial environment for their small PDP 11's, for positions entailing international travel and user contact at high level. Benefits include career prospects and relocation assistance. REF JH/CW.

## ANALYST/PROGRAMMER CITY — £11,000
From two years' BASIC + on DEC is required by professional services company utilising PDP 11/70s and micro computers. Initiative and a responsible attitude is necessary to design a variety of commercial applications. REF JH/CW

## CONTRACT REQUIREMENTS

| | | |
|---|---|---|
| PROGS COBOL CICS | SOUTH | ASAP |
| PROGS/A/PROG COBOL DL/1 CICS | MIDLANDS | ASAP/ACT |
| PROGS BUSINESS BASIC EXP. | LONDON | ASAP |
| PROGS/ANAL/PROGS IBM COBOL IMS | S. LONDON | ASAP |
| DESIGN/PROGS MICRO + 'C' | H. COUNTIES | OCT |
| PROGS VAX COBOL + DATABASE | H. COUNTIES | ASAP/JAN |
| PROGS RM or CIS COBOL UNIX | CITY | OCT |
| ANAL/PROGS DATA GENERAL + B. BASIC | H. COUNTIES | ASAP |
| SYST. PROGS MVS VTAM | LONDON | ASAP |
| ANAL/PROG VAX COBOL DATATRIEVE | CITY | ASAP |
| ANALYST PAYROLL CONVERSION | MIDDX | ASAP |
| A/P/DESIGNER PDP + MUMPS | LONDON | OCT |
| ALL LEVELS DATAPOINT/DATABUS | H. COUNTIES | ASAP/OCT/NOV |
| SYS ENG/PROG RSX 11M + FORTRAN | H. COUNTIES | ASAP |

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Activitiee include job and person specifications, edvertising copy/layout/placement, screening/shortlisting from edvertisements end computer-based candidate files, reference checking, vises, etc.

Currently there ie great scope for client development in the UK as well es abroed for both permenent and contrect eppointments.

Eseentiel is the pereonelity end determinetion to esteblish succeeeful client reletionships. Experience in either a DP or recruitment environment combined with e Selee/Merketing beckground would be ideel.

An excellent peckege will be offered, the formet of which isnegotiable.

For further Informetion pleeee contect either Roger Allington or Jenny Delrymple-Hey, dey on 01-493 2947 or weekends respectively Little Geddesden (044284) 3536, Beeconsfield (04946) 4579 quoting Ref. 5009.

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In juet nine short years we have grown into a respected force in the Interneliona l systems end eoftwere world. Now, with offices and work locetions eround the globe, our services are In demand by meny mejor commerclel organisations.

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| | | |
|---|---|---|
| IMS DB/DC | DB Administretor | London, Essex, |
| | Programmer/Analysts | Surrey |
| NOMAD | Programmer/Analyst | Surrey |
| 'C', CP/M | Programmers | London |
| ICL 2900, VME, COBOL | Team Leader | Essex, London |
| RPG11, S/34 | Programmer/Analysts | London |
| VM, DOS/VSE | Systems Programmers | Surrey |
| HP3000 | Programmer/Analysts | London |
| RAMIS | Programmer | Middlesex |
| MVS | Systems Programmers | Derby |
| DL/1, CICS | Systems Analyst | North London |

Contract or permanent, we cen offer you the renge of positions and epplications to broaden your technical expertiee and enhence your cereer edvencement into project menagement and beyond. We cen elso offer you excellent salaries plus the full range of benefits associated with e successful software house, including the opportunity to work on challenging projects throughout the UK, Europe, Middle East and possibly the USA.

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ESSEX CM14 4LR
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(5505)

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# Contract Assignments UK and Europe via IA

## Senior Analyst/Programmers — Holland
To join our existing team in The Netherlands developing a dynamic real-time, on line database and communications system for an international oil and shipping concern. A sound knowledge of IBM System 38 is required together with RPG III.
Due to the continued expansion of the data processing facilities to incorporate the total world-wide organisation this will enable successful candidates to become involved with a major communications network from its inception. Ref. 04/01

## Hardware/Software Author — Holland
Experienced author required to write end user documentation, clearly describing a real-time operating system and its utilities.
Internal architecture is based on 68000 or LSI II on this distributed system. Development will be on a VAX II/780 and a special purpose micro.
Experience with UNIX, C and/or VAX/VMS is desirable but not essential. Ref. 04/02

## Technical Author (Software) — France
Author to generate end user documentation for clients non-impact printer, utilising information gained from engineering specifications and in liaison with software engineers. Ability to communicate in French is essential for this position. Ref. 04/03

## Programmers — ICL 2900
Our customer requires experienced ICL 2900 programmers for project tasks commencing in October. Knowledge of IDMS is essential and TPS familiarity is also desirable. Programming language is COBOL.
**Northern Home Counties/Duration 6 months +** Ref. 04/04

## Programmers — ICL 2900
ICL 2900 COBOL programmers required for finance project. Ideal applicants should have sound knowledge of 2900 environment plus experience of code checking and optimisation.
**Northern Home Counties/Duration 6-8 months** Ref. 04/05

## Analyst Programmers — Process Control
For this project applicants must possess good practical experience of industrial process control programming using equipment of the DEC PDP/II type. Both low- and high-level language skills are desirable. Assembler and Fortran are ideal.
**Northern Home Counties/Duretion 8 monthe** Ref. 04/06

## Programmers — IBM
Starting in October this project requires IBM COBOL programmers who must have a knowledge of DL/1 and IMS/DB/DC.
**Midlands/Duration 4-6 months** Ref. 04/07

# Contract and/or Permanent
## Technical Authors
Hardware and Software authors for a large number of clients on projecte covering the following topics:
- Electronics and/or Radar HW and SW AVP 70
- Electronics, aircraft and flight simulator HW/SW.
- Software minis and micros, commercial applications.
- Electronics, marine applications, anelogue experience advantageous. HW/SW.
- Engineering and medical instrumentation. HW/SW.
- CPU hardware and instruction sets.
- Broad based software, commercial applications.
- Intelligent terminal documentation. HW/SW.
- Process control documentation. HW/SW.
- Telecommunication and networking documentation. HW/SW.
- Real-time and/or data communications HW/SW

Locations, various. Ref. 04/08

Outlined above is a selection of our current requirements, space and time make it impossible to list them all, however, if you are thinking of changing your job pleese telephone for an initial discussion or send a copy of your resumé for both contract and permanent positions.

Take this opportunity to discuss these and other requirements by phoning Hitchin (0462) 67141 or write to:

**Marketing & Recruitment Division**
**Industrial Artists Limited**
**21 Bancroft, Hitchin**
**Hertfordshire SG5 1JP**

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**DUN AND BRADSTREET**, the world's leading supplier of business information services, is establishing a new European Business Information Centre, to be sited in Uxbridge, Middlesex. Initially a range of services will be provided in five countries with the intention to extend systems to the rest of Europe.

The installation will be one of the most advanced data processing and distribution centres in Europe based on the latest IBM hardware and CULLINET, and MVS, CICS, IDMS and VTAM. Cobol is the main programming language.

The information services and products provided by Dun and Bradstreet Europe are the direct output of the computer installation and their provision demands sophisticated systems to process, manipulate and distribute the data. Therefore, of paramount importance is the development of precise, relevant software which must be continuously subject to stringent quality control.

SOFTWARE QUALITY ASSURANCE ANALYSTS are required to fulfil this vital function.

Their responsibilities will include:

- review and evaluation of software
- development and execution of test strategies
- creation of test data and files

Applicants will need proven analytical ability and experience of JCL and software testing techniques. Good written and oral skills will be expected.

Generous salaries of £8-11K will be paid and excellent company benefits.

Please contact Ivor Brookstone or Nick Marsh on

Suite 201/6 Albany House 324 Regent Street London W1R 5AA 01-637 9611

MANAGEMENT & EXECUTIVE SELECTION

(5436)

# PROGRAMMERS • SENIOR PROGRAMMERS
## MAJOR ICL USER TO £11,000 NORTH NOTTINGHAMSHIRE

### THE COMPANY

Is based throughout the U.K. and is amongst the largest and most successful in the high technology engineering field. Data Processing already plays an important role within the organisation and greater emphasis has been placed on centralised computing within the company. The installation operates the latest hardware and systems including ICL 2966, ME29's and DRS equipment. **New Development Projects will utilise advanced software including CME (VME 2900 & DME II), OMAC 29, IDMS and TPMS.**

A number of posts have been created to meet the demand for new systems, all of which offer excellent career progression and technical involvement to professional programming staff.

### SENIOR PROGRAMMERS

Three new positions have been created, each of which will have responsibility for a small team of programmers. You will report direct to a Project Manager and work closely with him in the definition of user requirements and the production of systems to meet user needs.

These extremely rewarding posts call for around 5 years ICL COBOL together with proven supervisory skills. Significant use will be made of Database and TP facilities, and expertise in these areas, especially IDMS, is important.

Additionally, you should combine the strong personal and communications skills which these senior positions require.

### PROGRAMMERS

Working within small project teams which offer continuity and a high degree of job interest you will be involved in the development and support of a range of applications utilising VME 2900, IDMS and TPMS. A minimum of 2 years solid ICL COBOL programming is required, and any knowledge of VME/IDMS will be of particular interest.

**Full relocation assistance to an extremely attractive part of the country is available where required.**

These posts offer excellent prospects, security and growth. To find out more please telephone **STEVE SYKES** on **Leeds (0532) 455911** during office hours or on **(090484) 350** evenings and weekends.

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## ELITIST?
### Analysts, Programmers Project Leaders Consultants

If you consider yourself to be well above average in terms of systems and programming experience and/or applications knowledge; if you are not satisfied with run-of-the-mill job opportunities; then you are probably the kind of person most likely to benefit from our specialised permanent and contract recruitment services for accomplished and discerning technicians.

Please contact Neill Skidmore or Elaine Westwood.

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## Currently in Technical Writing? Want to get into PR?

**Text 100** is a young, rapidly-expanding PR consultancy with a client list that includes a number of the most interesting companies in the UK microcomputer industry.

Text 100 currently requires a further technical writer with a general understanding of microcomputers to train in all aspects of press and public relations.

Interested? You'll need to be between 23 and 30 years of age, and have a lively and creative writing style and a genuine interest in microcomputers.

More importantly still, you will need a forceful, outgoing personality and the willpower to succeed among some of the youngest and most professional PR people in the industry.

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**Tom Lewis**
Managing Director
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## SYSTEMS PROGRAMMERS APPLICATION DESIGN PROGRAMMERS

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The following grades are required to work through our associate company in Saudi Arabia. Candidates should be well educated and our minimum age requirement is 25 years.

### Systems Analysts £25,000 Tax Free

Must have extensive PL/1 and Fortran linked with IBM environment. TSO MVS VM SAS and SPF knowledge essential. Good communication skills and documentation writing as well as some training experience advantageous.

### Supervisors — TP Services/ TP Equipment Analysts £25,000 Tax Free

Experience with large IBM Systems and MVS/JES 2, JES 3/TSO, VTAM, graphics and output on to Calcomp and Benson plotters as well as 3800 series printers.

We offer bachelor status contracts annually renewable, free accommodation and transport, paid leave to UK and all medical insurance.

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(6453)

# PUTTING TOGETHER THE ASDA TEAM. THE BUILD-UP CONTINUES.

## Application Programmers

Up to £12,000
Generous relocation expenses
Share Option Scheme
Training programme

COBOL programmers and senior programmers with at least 2 years' experience should be familiar with database and/or on-line programming techniques, preferably on IBM mainframe.

We would like you to have a knowledge of MVS with DB/DC, TSO/SPF and IMS but we have the resources to train you if your other attributes have impressed us.

Which leads us directly to 'Why should I consider working for Asda?'.

**Asda Superstores**
**Size, growth and commitment**

Bear in mind that working for large, growing, successful companies means having a lot of scope, plenty of projects, a range of software packages and tools available and a secure and stimulating future.

Asda is growing in a growth business. Turnover is up to £1.3 bn, we have 73 superstores and 18 stores (and rising) selling 27,000 different items, we employ over 20,000 people … and — of importance to you — we're committed to ensuring our information systems keep pace with the general growth.

**The Strategic Plan**

Recently this has meant a close look at how we will satisfy future needs. We call it the Five Year Strategic Plan. Stage One has been to install an IBM 3083 processor and we're introducing EPOS into more of our stores, using the programmable IBM 3680/3651.

However, very few programs are being converted. Instead we are writing new applications — largely for new on-line database systems — some of which will involve the Information Centre also being developed.

**The benefits of working for Asda**

Head Office Computer Centre is close to Leeds, in West Yorkshire. Communications are excellent in every direction which means easy travel to work from a wide area. The countryside can be stunning — as can the house prices!

Salary apart, there are many large-company benefits including the chance to participate in our success.

**Your next move?**

This is an exciting opportunity to join a team of people, with strong top-level management commitment, who will revolutionise information systems in a successful and growing company.

To receive an application form and information pack, telephone our consultants, McCourt Cousins Ltd, on Reading (0734) 595346, or write enclosing full CV to McCourt Cousins Ltd., 27-29 Greyfriars Road, Reading, Berks.

Interviews to be held regionally.

Asda

# Opportunities in Product Support

Datacommunications is one of the fastest growing sectors of the electronics industry and Racal Milgo's sustained growth record has put it well ahead of the field.

Our current product range enjoys an enviable reputation worldwide and includes modems, network management systems and local area networks.

The Product Support Group, based in Reading, Berks, has a key role to play in maintaining our leading market position and as a result of a planned expansion programme we now wish to strengthen the team.

Successful candidates will support a range of products and must be able to interface effectively both internally and with our distribution network in Europe, the Middle East and Africa. A limited amount of overseas travel will be required.

Applicants should be educated to degree level or equivalent and have gained experience in the design or support of modems; multiplexers; mini/microcomputers; local area networks; wide area networks. Knowledge of X25 products and networks would be an advantage.

In addition to attractive salaries — in a range of up to £14K — the Company offers over five weeks holiday, contributory pension with free life assurance and the opportunity for personal development in a thoroughly challenging environment.

Please write with full career details to:

Ian Melrose, Personnel Manager, Racal Milgo Limited, Landata House, Station Road, Hook, Hants, RG27 9JF.

or if you prefer telephone Hook 3911, Ext 305 for an application form.

RACAL
World leaders in electronics

# Programmers near Guildford

Our client is a Software House, specialising in financial applications to run on IBM or DEC equipment. They are currently expanding rapidly and wish to recruit programmers who either have experience within a Software House, or would welcome the challenge provided by this type of environment. You will be required to spend some of the time on clients' premises, which could involve you in time away from home. You will work on both batch and on-line systems, developing programs interactively. Sometimes you will be working in a team and on other occasions you will be required to stand on your own feet as the company's sole representative. In addition to the skills you bring with you, you will acquire others—in particular on micro-computers.

Please contact Joan Ainsworth on 01-681 8311 or write to her at Carolyn House, Dingwall Road, Croydon, Surrey CR0 9XF.

## IBM-GSD
**c.£11,000**

We are looking for at least 3 years' experience of programming, which must include a substantial amount of time spent on IBM-GSD equipment using COBOL and/or RPG.

## DEC—BASIC/COBOL
**c.£11,000**

This requirement is also for a minimum of 3 years' programming experience, gained in a commercial environment, which must have given you in-depth knowledge of some DEC systems, using BASIC and/or COBOL.

Computer Search & Selection

(5443)

# Head of Technical Support Croydon

This key position will appeal to a Systems Programmer who would welcome the opportunity to assume responsibility for a small team of Systems Programmers and Data Administration Staff, within an expanding installation. In addition to supervisory skills the job requires the ability to liaise with operations, users and suppliers in order to investigate, and advise upon, the relative technical merits of hardware, software, packages and related products. You will also be required to provide some in-house education/training for your own staff and users. A major requirement from the department is the provision of technical guidance and support to applications teams.

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- CICS
- DATAMANAGER
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- VSAM

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Computer Search & Selection

(5441)

Career development prospects with a leader in commodity trading

# Programmer

## Stratford, London E15

The Brooke Bond Group is a successful international business engaged in the marketing and distribution of tea, coffee, meat and other food products: the importing, processing and distribution of timber and allied products, the operation of plantations and ranches, commodity trading and specialist manufacture and services in the printing and microbiological fields.

The Group's commodity trading business in the UK is based in Stratford, London E15. A DEC PDP 11/44 computer has recently been installed to handle the accounting and stock control functions. Computerisation of other aspects of the business will follow.

This is an interesting career development opportunity for a Programmer with at least two years' experience in BASIC+2, RMS and RSTS/E gained in a commercial environment. Ideally, candidates will have experience of telecommunications and in the operation of a PDP 11/44 with RMO2 disc drives.

As well as a competitive salary and pleasant working environment, there are genuine prospects of promotion. The job also offers a measure of security with this major international business. Further training will be made available where required.

Ring Basil Lansdale, Personnel Manager, on 01-248 6422 for an application form or send him a brief career profile including current salary.

Brooke Bond Group plc, Thames House, Queen Street Place, London EC4R 1DH.

Brooke Bond Group plc

(5484)

## SENIOR APPOINTMENTS - £14K +

# SOFTWARE SALES

## £25,000 package London

The Fraser Williams Group, comprising of 13 regional companies, is one of the country's foremost Computer Services organisations, providing extensive project orientated DP services to commerce and industry.

The London Company requires additional sales consultants to enlarge the client base in the areas of DEFENCE, MANUFACTURING, INSURANCE and OIL. If you have experience of selling in one of these market areas plus the following qualities:

- ★ A proven sales record in DP software services;
- ★ A sound technical background, based on a career progression from computer systems development into sales;

**Then you should contact Bernard Taylor on 01-930 4041 office hours, or Hayling Island (07016) 66768 evenings, to discuss the opportunities, which include a high basic salary with realistic targets.**

(5450)

Fraser Williams
Recruitment & Training
19 Charing Cross Road,
London WC2H 0ES.

# Commercial Director Surrey

Our client is a new software house, which is part of a group that may be fairly described as a "household name." The company will be providing a wide range of solutions to business problems, including consultancy services, bespoke software, applications packages and hardware (both mini-and-micro computers) within specific vertical markets. It is intended that these markets should be Property Management, Commodity Broking and Export Shipping.

## c.£22,000+Car

We are looking for a very experienced consultant, used to running project teams and being involved in pre- and post-sales activities, who would welcome the opportunity to make their own mark on the company, by being involved in its strategic development. A further responsibility will be the administration of the company. Early tasks will include the recruitment of professional staff and "hands-on" consultancy. It is considered that anyone under 35 will not have had sufficient time to acquire the degree of business acumen and wide-ranging practical experience, required for this key appointment.

Please send a detailed cv to Joan Ainsworth at Carolyn House, Dingwall Road, Croydon, Surrey, CR0 9XF.

Computer Search & Selection

(5442)

OPPORTUNITIES IN THE PUBLIC SECTOR
RECRUITMENT FEATURE
SEPTEMBER 22

This feature, with full editorial support, will highlight job opportunities in this developing area of the computer market.

For further information, please contact:
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01-661 8787 (consultancies)

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(5326)

# SOFTWARE DESIGNERS

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## To £14,500 + Benefits

My client is one of Europe's most impressive and fastest growing electronic companies and is based in an attractive south-coast location. With American parentage the company is achieving rapid market leadership with high profitability and major investment in advanced micro-technology.

This is a new and exciting opportunity for high calibre SOFTWARE DESIGNERS/PROGRAMMERS/ENGINEERS with some 2 years experience in one of the following:-

* Real-time microprocessor systems
* High level languages e.g. Pascal (for developing applications software)
* Assembler

Appreciation of electronics with an understanding of 8 bit microprocessors (6800 family) or RSX-11 based systems would be an advantage.

Build on your software/firmware programming experience to become involved in this young dynamic multi-disciplinary team to achieve technical and management rewards within a fast moving success orientated company based in an attractive south location.

Starting salaries to £14,500 + Benefits.

Contact Shakeel Ahmed B.Sc.

*To discuss your microtechnology future call Shakeel Ahmed B.Sc. on Windsor (07535) 56155 or write to us at:- Kramer Westfield Associates Ltd, 23 Victoria Street, Windsor, Berks SL4 1HE.*

Kramer Westfield

(5479)

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## Bahrain
## c. £21,000

Our Computer Services Department is currently engaged in the implementation of on-line facilities with over 80 VDUs and printers.

Due to promotions and expansion we are seeking a Computer Services Manager. The successful candidate is likely to be aged 30-40 years, with a Post-Graduate qualification or membership of a professional body and ten years data processing experience which must have provided practical experience in COBOL programming, systems analysis and telecommunications associated with the development of on-line systems as well as a minimum of four years experience in the management of a medium to large DP facility.

In addition to the tax-free salary will be a car allowance, a contributory Provident Fund, free furnished accommodation and excellent terms of service.

Applications with c.v. to:—
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Yusuf Bin Ahmed Kanoo

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(5547)

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UNIVERSITY OF LONDON
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## APPLICATIONS/ADVISORY PROGRAMMER

Applications are invited for the post of Applications/Advisory Programmer to start as soon as possible. The Computer Centre is recently established and provides a service to a wide range of academic and administrative users of the College VAX 11/750.

The advisory service supports computing on the VAX as well as the link to the University of London Computer Centre and work on a number of microcomputers. We are looking for an adaptable person to give advice to all members of the College and to work on a wide range of new programming projects. There will be an opportunity to specialise in one or more of the following areas: – graphics/computer art, statistics, information retrieval, computer aided learning and computer literacy. Applicants should preferably be graduates with experience of programming but non graduates with good programming skills and experience will also be considered.

Salary within the range £7,677 × 6 increments to £9,258 per annum inclusive.

Write for further details to the Personnel Officer, University of London Goldsmiths College, New Cross, London, SE14 6NW. Closing date for receipt of completed application forms 23rd September 1983.

(6373)

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# SYSTEMS PROGRAMMER

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From Day 1 you will be working with a good deal of autonomy, with direct responsibility to the DP Manager. You will, in effect, be the "Technical Department" with a brief to provide technical assistance to operations, the development teams, and supporting the operating system. The planned expansion of DP within the Group will lead to your involvement in the setting up of a communications network.

It's a challenging opportunity that demands at least three years DP experience to include a minimum of 18 months Systems Support on DEC software under RSTS/E.

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(5449)

**Fraser Williams**
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A WEALTH OF OPPORTUNITY

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**REAL-TIME DEVELOPMENT** **SOUTH COAST** **Package to £15k+**

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Ever increasing demand in home and overseas markets has created the need for additional specialists at Designer/Programmer and Project Leader levels.

As a member of a small team, you will enjoy the stimulus and challenge offered, by working on important projects in the fast growing area of communications technology. At the same time you will develop your own skills and experience. Success in these roles will naturally lead to career progression and even greater responsibility and reward.

A demanding environment such as this calls for people of graduate status or equivalent with at least three years' experience of Real-Time software. ASSEMBLER or knowledge of an appropriate high level language such as CORAL are the language requirements.

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(6474)

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Please Tick: Contract ☐ Permanent ☐ Operations ☐ S&P ☐

(5515)

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# Earn up to £23k free of tax in the Arabian Gulf
# Excellent conditions and package
# Latest hardware and software techniques

ARAMCO (the Arabian American Oil Company) without doubt the world's largest oil producer has invested in one of the industry's most ambitious exploration exercises with the formation of their Exploration and Petroleum Engineering Centre with its own dedicated computer facilities. The size of the operation and its continuing development is such that there is an additional need for highly skilled manpower.

The computer centre is equipped with an advanced IBM configuration of 3033's and 3081 running under MVS JES2, VM and its associated software products and peripherals, plus a variety of graphic plotting equipment.

For the further development and support of their seismic and geophysical applications they are looking for the following personnel:

**IBM Project Manager – c.£23k** who should have been in the data processing industry for at least eight years and have acquired diverse skills in project management and co-ordination and who at the same time can be responsible for staff training and career development. Some knowledge of PL/1 and/or FORTRAN and familiarity with IBM software products such as SAS and VM would be an advantage. This is a responsible position which will require good communication skills and the ability to oversee and administer high level projects.

**MVS Systems Programmers – to £23k** – to be involved in the system generation of the IBM configuration which utilises, amongst others, the following program products: JES2 TSO VTAM ACF2 HCUF HSM VM CMS MSX SAS etc. New products are constantly being reviewed and the opportunity to become familiar with the latest techniques is a feature of these challenging positions.

**Analyst/Fortran Programmer – to £23k** – to become involved in the development and support of petroleum engineering projects requiring experience of simulation software (ideally in reservoir engineering) preferably with some exposure to graphic systems.

**Analyst/PL/1 Programmer – to £23k** – with experience relevant to petroleum engineering to become involved in the design, development and implementation of projects. Familiarity with a large scale IBM environment would be an asset.

*A degree or HND would be preferred for the above requirements.*

For both their mainframe operations and the graphics computer area they are looking for a high level of competence from the following personnel:

**IBM Senior Operators – c.£20k** – These are excellent opportunities offering good promotional prospects for shift leaders/supervisors with at least 4 years large mainframe experience. Successful candidates would have worked on IBM 3033's and 3081's under MVS, JES2 or 3, TSO and other software facilities associated with a TP network and database environment.

**VAX Senior Operators – to £20k** – for operation of a VAX 11/780 using VMS.

**Microfiche/Printer Senior Operators – to £20k** – to supervise the function within the IBM 3800 printer and microfiche operation.

**Senior Graphics Operators – to 20k** – to supervise the operation of Benson Varian and Calcomp plotters, perform quality control on displays and co-ordinate with maintenance and network operation personnel. Experience with any brand of graphics devices would be acceptable.

ARAMCO is located on the Arabian Gulf and enjoys the benefits of a company operated community with splendid recreational facilities. Successful candidates can expect subsidised air conditioned accommodation, free medical treatment, generous holidays and return flights to the U.K. The contract of employment is for an indefinite term and is on a single status basis.

For further information and screening interviews please contact **Penny Stock** on **01-836 8411** at **Computer People London, VLI House, 88-89 St. Martin's Lane, London, WC2N 4JS.**

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MERIDIAN CORPORATE MANAGEMENT 63 WIGMORE ST. LONDON W1. 01-486 2821

A major multi-national engineering group based to the West of London is seeking senior personnel for their technical services division

## TECHNICAL SERVICES MANAGER

**to £15,000+car+benefits**

Our client requires a professional with at least five years' experience of IBM systems and extensive knowledge of **MVS, CICS, DL/1, ACF/VTAM, ACF/NCP.** You will be aware of the latest developments in the computer industry and will be able to evaluate and implement new hardware and software strategies. The ability to communicate with users and senior management, and the potential for self-development are important criteria. European and some US travel will be necessary.

## DATABASE ADMINISTRATOR

**to £15,000 plus benefits**

You will have a **COPICS** (or similar) background and an extensive knowledge of the **DL/1 Database.** Liaising closely with the systems development staff, you will provide guidelines and standards and ensure that availability, integrity and security of the Database is maintained. Already proficient, you will be looking to advance from your current position and will be seeking a career with a company dedicated to the development of sophisticated on-line systems.

*MCM is an international consultancy with a background in sales, management and education in the computer industry. All enquiries are dealt with in the strictest confidence and you will be dealing with consultants who have an in-depth knowledge of all aspects of Data Processing gained at technical and senior management levels.*

Telephone us now on **01-486 2821/2508** for further details

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MERIDIAN CORPORATE MANAGEMENT 63 WIGMORE ST. LONDON W1. 01-486

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**to £14,500 plus benefits**

Ideally you will have spent the last three years' as an analyst in a manufacturing environment and have a background in programming. It is essential that you are a good communicator and can control the development of sophisticated on-line systems. A knowledge of **COPICS** and **Database** is advantageous.

## PROGRAMMING SUPERVISOR

**to £14,500 plus benefits**

If you have a good knowledge of **COBOL** programming in an on-line environment and experience of **Database,** this could be an ideal career opportunity. You will be responsible for a team of programmers working on a number of important projects. Liaising closely with the systems analysts you will ensure that programming standards are met and maintained. You will also have responsibility for training and the ability to control and motivate junior staff is important.

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# Are you making the best of all your IBM experience?

**Altergo, part of Data Logic, has great career opportunities right now for Programmers, Analyst Programmers, Systems Designers, Project Leaders and Lecturers.**

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* Drive, initiative and the ability to get on with people.
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* For small business systems you'll have experience in System 34 and/or System 38 and associated languages RPG II and RPG III. A knowledge of DMAS or MAAPICS will be a big advantage.
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## You'll have:-

* An opportunity to join a fast-moving company with a lot of new projects in hand and starting up.
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* Plus the benefits associated with a major company.
* A working environment that treats you like the professional you are.
* The chance of working in a company with a depth of IBM expertise that is unmatched in Europe.

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# Programming Team Leaders/Senior Programmers up to £16k

## Uxbridge Area

### LARGE SCALE ON-LINE AND BATCH SYSTEMS DEVELOPMENT

### CAN YOU MAKE A KEY CONTRIBUTION?

The success of our client's undertaking to establish their European Business Information Centre will depend on the quality of the technical leadership.

This major project provides an outstanding opportunity for software professionals wishing to take full advantage of their technical skills end rapidly progress up the management ladder.

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PROGRAMMING TEAM LEADERS AND SENIOR PROGRAMMERS are required now to lead and carry through the technical development of major on-line and batch systems. You will be expected to demonstrate –

- ★ IN-DEPTH CICS OR IDMS EXPERIENCE
- ★ COBOL PROGRAMMING BACKGROUND
- ★ PROVEN LEADERSHIP ABILITY
- ★ DYNAMISM TO SUCCESSFULLY DEVELOP GROUND-FLOOR PROJECTS

If you are a programming team leader, senior programmer or have the ability to be one, then this is an opportunity not to be missed.

GENEROUS SALARIES OF UP TO £16K will be paid and excellent corporate benefits will include a pension scheme, including life assurance, private medical cover and assistance with relocation where applicable.

*Please contact Ivor Brookstone on 01-637 9611*

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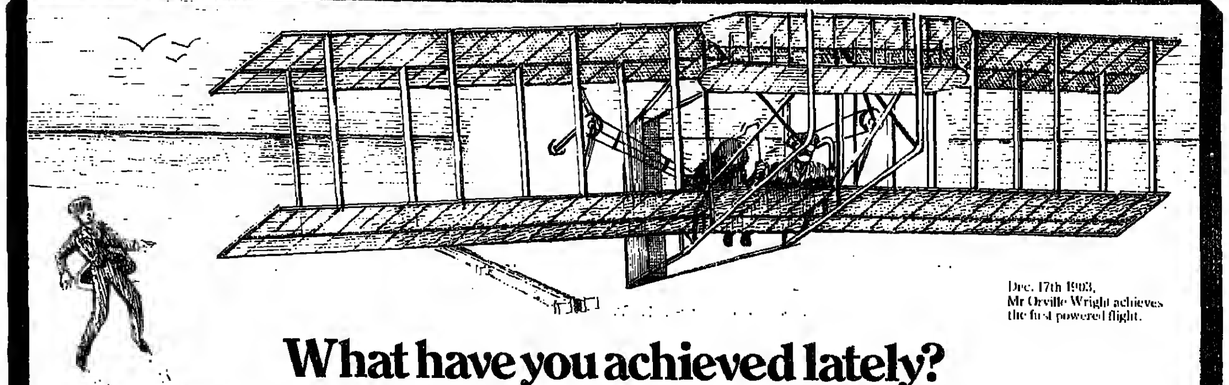

Dec. 17th 1903, Mr Orville Wright achieves the first powered flight.

# What have you achieved lately?

**PROJECT MANAGERS**
**SYSTEMS DESIGNERS**
**SOFTWARE ENGINEERS**
**c. £16-28,000**

Do you ever ask yourself what you have achieved? Do you ever wonder why some people realize their potential while others do not? The Wright brothers realized a dream – so can you in the right environment.

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The benefits associated with these international assignments are considerable over both long and short term; they can be summarized as follows:

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This NATO technical establishment has a vacancy for a

# SENIOR PROGRAMMER

to participate in all phases of program design and development on various challenging projects including complex real-time systems, dedicated laboratory computer systems, computer networks, man-machine interface studies, military systems simulations, information systems and scientific calculations.

This post offers possibilities for variety in assigned tasks and broadening of computing experience, as well as encouragement of professional development in the Computer Science and Software Engineering fields.

**QUALIFICATIONS**

Education to GCE 'A' level in relevant subjects with six years' appropriate experience, or HNC with four years' experience. Sound practical knowledge of at least FORTRAN or PASCAL, together with software development utilities. Applicants must also have made a significant contribution to at least one major software project.

Gross annual salary for married personnel without children is DG. 57,300 = (tax free).

Contract will be offered for an initial one year period with the possibility of renewal on an indefinite basis.

Candidates who are nationals of one of the NATO countries are invited to send full details of training, experience and personal data to the **Personnel Officer, SHAPE Technical Centre, P.O. Box 174, 2501 CD The Hague, The Netherlands, not later than September 30, 1983, quoting reference IS-B5-83.**

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**£12,000-£14,000**
**NORTH HERTS.**

Recent expension has created a new opportunity within a small but demanding company for a Consulting Analyst.

The position involves working with clients and colleagues to specify, develop and implement new software systems in management information, production control and materials planning using a range of microcomputers.

The successful applicant will be aged between 25 and 40 with proven experience of microprogramming (ideally PASCAL and BASIC) and analysis, together with the ability to communicate with customers at all levels.

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Portico Technology, a fast expanding micro computer manufacturer, urgently requires additional sales and support staff:

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An experienced executive is needed to cover the North of England with one day a week in London. A clean driving licence is essential. Planned earnings £16,000-£18,000 + Car.

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*Please write, enclosing c.v., to Mary Tatton, Sales Director*

PORTICO TECHNOLOGY LTD
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# IDMS Database Analyst

## Uxbridge Area c£14k

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| **THE COMPANY:** | DUN AND BRADSTREET, the world's foremost supplier of business information services. |
| **THE SCOPE:** | To establish a new European Business Information Centre. This exciting undertaking will serve five countries initially, with the intention to extend systems to the whole of Europe. |
| **THE SYSTEMS:** | The information services and products are the direct output of the advanced installation, and the sophisticated software demanded for processing, manipulating and distributing the data will all be incorporated within databases. IDMS is the chosen system. |
| **THE ROLE:** | A DATABASE ANALYST is required to play a leading role within a growing high-calibre team. Responsibilities include:<br>● making design decisions and carrying them through<br>● providing technical expertise and support to development teams<br>● supporting operational databases |
| **THE REQUIREMENT:** | IN-DEPTH IDMS EXPERIENCE<br>ANALYSIS AND/OR DESIGN BACKGROUND<br>SELF-MOTIVATION<br>GOOD INTERPERSONAL SKILLS |
| **THE OPPORTUNITY:** | The chance to be in at the start of an outstanding new development and to grow with it. |

***A GENEROUS SALARY OF c£14K WILL BE PAID AND THERE ARE EXCELLENT COMPANY BENEFITS AND WORKING CONDITIONS.***

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# Programmers... ...DP Auditing can offer you career development.

## £9,000 - £12,000

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Our ability to keep pace with this growth is based on an ever developing DP installation, comprising IBM 3081/3033 and 158 operating under MVS/SP with ACF/VTAM, CICS and ROSCOE with teleprocessing links to Europe and the USA, plus other peripheral hardware.

Tight control in operating our DP systems is essential and DP Auditors have a vital role to play in developing the audit procedures, using a variety of up to date techniques. Continued expansion has created several challenging new opportunities within the existing DP Audit team. A structured career path exists in the department, opening up promotional opportunities for staff with ability. Applicants should have a minimum of 3 years' COBOL programming plus general business experience.

Salaries will be negotiated according to experience, and will be backed by a valuable range of large company benefits including a non-contributory pension and life assurance scheme, 28 days holiday, free banking, loan facilities after a qualifying period, subsidised restaurant, flexitime and an excellent sports and social club. Relocation expenses will be paid where appropriate.

So if you're looking for a career move that's a move for growth, telephone or write for an application form to: Mrs Hazel Stokes, The Joint Credit Card Company Limited, Chartwell House, 365 Chartwell Square, Southend-on-Sea, Essex SS2 5ST. Tel: Southend (0702) 352266, ext. 3237.

ACCESS

# LONDON AND THE HOME COUNTIES

## URGENT REQUIREMENTS

**LONDON & HOME COUNTIES £7-£20,000**

| | | |
|---|---|---|
| RPG II, LEARN RPG III | INSURANCE | to £11K |
| SENIOR PROG TANDEM | MORTGAGE | to £11K |
| GSD, LEARN 4300 CICS | BANKING | to £12K |
| TSO, PL1 OR COBOL | INSURANCE | to £13K |
| GSD, CONSULTANCY, PROJECT LEADING | | c. £15K + CAR |
| COBOL CICS ANALYST PROG | INSURANCE | to £13½K |
| UI100 PROGS, KENT | MORTGAGE | £NEG. |
| ADABAS NATURAL ADF COBOL PL1 | TRAVEL | c. £12K |
| DPM SMALL SITE E. MIDLANDS | | c. £14K + CAR |
| ANALYSTS LARGE IBM COMMERCIAL | | c. £13K |
| SENIOR PROGS PL1 FINANCIAL MORTGAGE | | C £11K |
| RPG II OIL CO. TRAVEL, PROJECTS | | to £14K |
| HERTS OS DS/OC or TSO/SPF COBOL | | £9-19K |
| 12 TO 18 MONTHS' IBM COBOL, MANY JOBS | | £7-9K |
| STANDARD CO-ORDINATOR GOOD ADMIN | | c. £10K |
| PL1 ANALYST PROGS LOTS OF DEVELOPMENT | | £12K |
| BURROUGHS PROGS – ALL AREAS, DATABASE DESIGN | | £NEG. |
| HP 3000, ANALYST PROGS IMAGE, VIEW, 18 MONTHS | | £10K |
| SERIES I PROGRAMMER, CONSULTANCY WORK IN BELGIUM | | £12K |
| COBOL CICS 1 YEAR W. LONDON, TRAINING GIVEN | | £10K |
| PL1 MVS IMS CENTRAL LONDON, NEW TEAM | | to £14K |
| SOFTWARE HOUSE, PROGRAMMERS & DESIGNERS U.K. & EUROPE | | to £20K |
| COBOL/CICS, FINANCIAL 18 MONTHS | | £9½K |
| DG FORTRAN + ASSEMBLER COMMERCIAL & SYSTEMS EXPERIENCE | | £9-12K |
| DEC BASIC & DIBOL CHANCE TO MOVE TO IBM PROGRAMMERS | | £8½K |
| HP COBOL ANALYST/PROGS COMMERCIAL SYSTEMS, LONDON & ESSEX | | £8-14K |
| ICL 2955 COBOL PROGRAMMER VME TPS ON-LINE, FRIENDLY SITE | | £8½K |
| INTEL 8085/51/88 SOFTWARE & H/W ENGINEERS ASSEMBLERS, ALL AREAS | | £14K |
| BUSINESS ANALYST ON ICL PROGRAMMING B/G PRODUCTION & FACTORY, BERKS | | |
| VAX VMS FORTRAN MACRO EXCELLENT OPPORTUNITIES THROUGHOUT LONDON AREA | | to £15K |
| DEC PDP 11/70 ANALYST PROGS IN SURREY SOFTWARE HOUSE | | c. £12K |
| NETWORK SUPERVISOR, BANKING ENVIRONMENT, EXCELLENT BENEFITS, BASIC | | £13K |
| ICL PROGRAMMERS & ANALYST PROGS, ALL LEVELS | | £8-13K |

## TELECOMMUNICATIONS
**DESIGN AND SUPPORT**

Based on the South coast a market leader has identified a number of vacancies at various levels within the company. The positions include Systems Consultant, Principal Programmers and Programmers of all levels. Experience is required in the areas of INTEL 8085/86, UNIX SCPL PL/M X25 Telex, ASSEMBLERS, and other Real-Time systems. Obviously we are unable to detail the range and scope of opportunities within this advert but would suggest that you contact MARSHALL CLIGMAN at our London office for further information. All enquiries will be treated as confidential.

## COBOL REQUIRED

Two of our top clients have asked us to recruit COBOL Programmers with 1 to 3 years' experience who would be willing to retrain on ICL 1900/2900, VAX, and IBM SYS 38. Experience on these machines would be an advantage. A mature outlook and a real desire to 'get on' in DP is required. There are opportunities for travel and user contact and both companies can offer 00201037salaries and long-term prospects that are excellent.

## ICL + HP ANALYSTS AND PROGRAMMERS

A major institution in LONDON require top calibre staff for a number of interesting and varied roles within the organisation. At the Analysts level applicants can expect to work under their own initiative to design and implement systems and particular importance will be attached to good communications skills as well as to directly relevant computer experience. For Programmers there are several openings with experience centred around ICL 1900/2900, DME, VME, DRS, IDMS and on HP 3000 under IMAGE. COBOL is essential.
For further details please contact Marshall Cligman.

## ANALYST PROGRAMMERS
**CITY to £12,000**

An international software house require Support Programmers or Analyst Programmers to help in exciting new developments. Your two years' experience on PDP or VAX with a knowledge of operating systems will be invaluable. Exposure to a communications environment would be useful and your ability to react intelligently and effectively to situations and problems will also be of help. Some travel is envisaged to implement systems and to assist users. These positions offer the successful candidate a good salary, an interesting and rewarding environment and the kind of experience that could be invaluable. Ring our LONDON office today for an immediate interview!

## MAJOR INSURANCE COMPANY
**SENIOR SYSTEMS PROGRAMMER c£15,000**

This rapidly expanding insurance company based in the City, require a systems programmer with not less than 3 years' experience in a large IBM systems software environment. You should have had exposure to MVS or OS along with extensive usage of IMS/CICS. Any knowledge of IBM internals such as ACF/NCP, ACF/VTAM will be a distinct advantage. Normal insurance benefits apply.

## IBM CONSULTANCY
**ANALYST/PROGRAMMERS c£12,000 NEG.**

Have you got what it takes!! All you need is about 2 years' COBOL or PL/1 experience gained in a commercial environment. If you have any other attributes such as DL/1 or CICS, then obviously your salary will be higher. If you haven't, don't worry, as extensive TRAINING WILL BE GIVEN. Get out of that end user rut, and call us now to discuss this exciting opportunity further.

## INTERNATIONAL BANKING
**RPG II c£12,000**

A major international bank has an opening for an experienced RPG II analyst/programmer to move into the demanding role of finance consultancy. Ideally, you should have a solid programming background coupled with some exposure to analytical duties, gained in a GSD environment. Banking experience is NOT ESSENTIAL as full training in banking systems will be provided. Company benefits include cheap mortgages, free lunches and personal loans.

## GSD CONSULTANCY
**ALL LEVELS £10-14,000**

Excellent opportunities exist for analyst/programmers and project leaders within this specialist consultancy. The company develops commercial applications software for IBM S34 and S38 users and have a remarkably successful track record in their field. Good RPG II or III experience is needed, coupled with solid analysis skills and team leadership for the more senior positions.

# MIDLANDS

## IBM CICS PROGRAMMER
**WEST MIDLANDS Circa 10K**

The client is one of the largest users of IBM Technology in the Midlands and is at present seeking to add to its complement of application programmers.
Experience of one of the large main frame computers, with an understanding of CICS is desired, coupled with a desire to progress with a company dedicated to the use of information technology.

## MANUFACTURING ANALYST/ PROGRAMMER
**WEST MIDLANDS Circa 10K**

Experienced programmers with at least 3 years' experience in the field of manufacturing systems are needed to join a household name company as their number two of the department.
A knowledge of IBM GSD systems or RPG programming would be desirable, but is not essential, a thorough knowledge of manufacturing systems is more important.

## DATA GENERAL ANALYST/ PROGRAMMERS
**Circa 10K + Car**

We have two clients who are seeking experienced Data General Analyst/Programmers, one in the South Midlands and the other in the West Midlands conurbation.
Experience of financial systems or management accounting is desirable, coupled with drive and ambition.
Both positions also carry several fringe benefits, such as BUPA, subsistence allowance, free petrol, etc.

## CP/M PROGRAMMERS
**Circa 10K**

Programmers and Analyst Programmers with several years' experience of CP/M systems are required for an up and coming software house in the East Midlands. Experience mainly of manufacturing or light engineering systems is particularly desirable. Especially any experience of the Televideo range of hardware.

## STOP PRESS

Software Engineer, Nottingham £10K
[illegible] Programmer/Analyst Coventry £10K
[illegible] Team Leader Birmingham
RPG II Analyst/Programmer Birmingham
Salesman Hardware sales West Midlands
Engineer/Programmer [illegible]

**TCR**

# Targa Computer Recruitment

6 Liverpool Street London EC2M 7NH Telephone 01-283 9941 Telex 25851
Monaco House Bristol Street Birmingham B5 7AS Telephone 021-622 2045 Telex 334237

# Creative Programming Specialists

## £8,000 – £12,000

What can we offer you? If you have gained at least twelve months' experience in realtime high-level programming you will undoubtedly benefit from these exceptional career opportunities. Our projects are leading edge, centring on the very latest computer and communications architecture, assuring you of immediate technical and personal advancement, following initial training.

Our new European Development Centre is purpose built and equipped with the latest software development tools to aid your creativity.

UNIX ★ 'C' ★ INTEL MDS ★ PL/M ★ RMX/86

You will be joining a talented team of experts whose combined skills will ensure that we maintain our position as a leader in the fastest growing market of the eighties.

We are the European subsidiary of a $ multi-billion communications group with a major investment in new product R & D in the UK. Our location in the Northern Home Counties is easily accessible from London or the South Midlands; however if you need to relocate, assistance can be offered to suitable candidates. Enhance your real-time programming experience and fulfil your career aspirations by contacting **Alan Carnell** or **Steve Stark** on 01-935 0671 or Harpenden 05827 2976 evenings and weekends 7-9.00 pm. Alternatively submit your Curriculum Vitae to our London office.

Technical, Sales & Management Appointments

**SCR**

**Specialist Computer Recruitment Ltd**

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| James House, 46 James Street, London W1M 5HS 01-935 0671/486 0481 | 35-37 Great Charles Street, Queensway, Birmingham B3 3JY 021-236 3781 | International House, 84 Deansgate, Manchester M3 2ER 061-833 0427 | Avenue Louise 327, Boite 4, 1050 Bruxelles 010 322-640 7151/71 | Willemsparkweg 92, 1071 H.M. Amsterdam 010 3120-760947 |

MANAGEMENT & EXECUTIVE SELECTION

# READ NEXT WEEK'S COMPUTER WEEKLY

**for details of 1983/4's outstanding recruitment opportunities for Analyst/Programmers, Programmers and Operating Staff or call Ivor Brookstone on 01-637 9611**

# EXPERIENCED PROGRAMMER

Pretty Polly is the largest Individual Ladies' Hosiery Manufacturer, the Brand Leader in the UK Hosiery market and one of the largest producers in the world. The Company's headquarters and manufacturing plant is located in Sutton-in-Ashfield, Nottinghamshire and there is a second manufacturing Company in Killarney in the Irish Republic.

Our current Computer Installation consists of an I.C.L. ME29, operating under TME and is supported by two remote ICL System 10/120s and an I.C.L. DRS 20 system.

We are looking for a fully experienced Programmer to join a small team engaged in all aspects of commercial business systems.

Ideally candidates will have several years experience of programming in COBOL and it is essential that some of this time has been spent on communications applications (preferably TME TP). A knowledge of PLAN would also be a distinct advantage.

A competitive salary, based on experience and excellent fringe benefits will apply, including a contributory Pension Scheme and Free Life Assurance.

Please write or telephone for an application form to the Personnel Department, Pretty Polly Limited, Unwin Road, Sutton-in-Ashfield, Notts NG17 4JJ. Telephone: Mansfield 552500.

PRETTY POLLY

**Pretty Polly Limited**
**Unwin Road, Sutton-in-Ashfield, Notts. Tel: Mansfield 552500.**

OPPORTUNITIES WITH GILDEMEISTER PROJECTA

# SAUDI ARABIA

GILDEMEISTER PROJECTA a successful international company employing over 4,000 personnel in locations worldwide, is engaged in a major project to develop and operate the Jubail Human Resources Development Institute at Jubail Saudi Arabia. To assist in this exciting project we have an immediate requirement for the following

## MANAGER OF PLANNING
**c £30,000 TAX FREE**

A creative, versatile SYSTEMS ANALYST is required to develop a comprehensive Management Information System for the effective operation of a vocational training centre for up to 1000 Saudi National students being trained in 16 different skills.

The successful applicant should have 3-5 years experience and the appropriate qualifications necessary to manage a small team developing a system to extract and collate data using several Apple II's and then preparing it in a presentation format.

**We offer a one year renewable employment agreement with a competitive benefits package. Qualified applicants should forward full C.V. to:**

**GILDEMEISTER PROJECTA**
**105 Oxford Road, Reading, Berks RG1 7UD.**

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# The real Operations Management Challenge!

## OPERATIONS MANAGER and PRODUCTION CONTROL MANAGER
## to £20k + car

**Dun and Bradstreet are the world's leaders in the supply of information services to the business community. Business, marketing and financial information is the crucial factor to the success of commerce and industry – AND IS THE DIRECT PRODUCT OF THIS ORGANISATION'S DATA PROCESSING FUNCTION!**

Dun and Bradstreet have now embarked on the creation of a new European Business Information Centre for its operations throughout the continent. Sited in Uxbridge, Middlesex, it will be one of the most advanced data processing and distribution centres in Europe with the latest offerings from IBM and CULLINET, initially 3083 hardware and MVS, CICS, IDMS and VTAM.

AN OPERATIONS MANAGER AND A PRODUCTION CONTROL MANAGER are required now to bring their relevant experience, expertise, and man-management ability to the pre-installation planning and development stage and then take full responsibility for the efficient running of their departments. They will report to the Director of Information Services.

**THE OPERATIONS MANAGER**
Responsible for the successful running of the technically advanced installation, which produces the company's information products and services. He and his team are, therefore, controlling the very foundation of Dun and Bradstreet Europe's operation.

**THE PRODUCTION CONTROL MANAGER**
Will take charge of all aspects of quality control, job scheduling/set-up and production services. Particularly important will be the setting up and maintaining of standards within Information Services, liaison with users and determination/analysis of service levels.

Both will have at least five years' experience of IBM equipment and software/business practices plus

★ PROVEN MANAGEMENT AND INTERPERSONAL SKILLS
★ SELF-MOTIVATION
★ CONVERSANT WITH MVS ENVIRONMENT
★ ABILITY AND EXPERIENCE TO SET UP "GROUND FLOOR" PROJECTS

**A SALARY OF UP TO £20,000 WILL BE PAID** for both positions plus a car and there are other excellent company benefits.

*Please contact Ivor Brookstone or Nick Marsh*

Suite 201/6 Albany House 324 Regent Street London W1R 5AA 01-637 9611

**MANAGEMENT & EXECUTIVE SELECTION**

# A prestigious position as Head of Commercial Data-Processing

**Career opportunity in Kuwait**

One of the leading Companies in the Middle East with highly advanced technology requires a career minded DP professional to assume divisional responsibility for the direction and administration of all aspects of the Company's commercial dataprocessing activities.

The Company is embarking on a strategic programme of intensive development work in the fields of database management and network technology and requires an energetic, experienced individual with a commitment to technical excellence and the maturity and personality to lead and motivate a team of 58 computer staff to assist the Company in achieving its ambitious plans for the future.

In addition to developing new commercial systems and maintaining and enhancing existing systems, the Head of Commercial Data Processing will also supervise the physical operation of the installation, which consists of several ICL mainframes.

If you are a graduate, preferably in Business Administration/Computer Science with sound organisational abilities and at least 10 years experience of project management, hardware and software selection, staff supervision and installation management in the Oil or related industries, this is an ideal opportunity for you to expand your career horizons with a progressive Company, firmly committed to the new technology in a country which offers excellent sports facilities for you and your family.

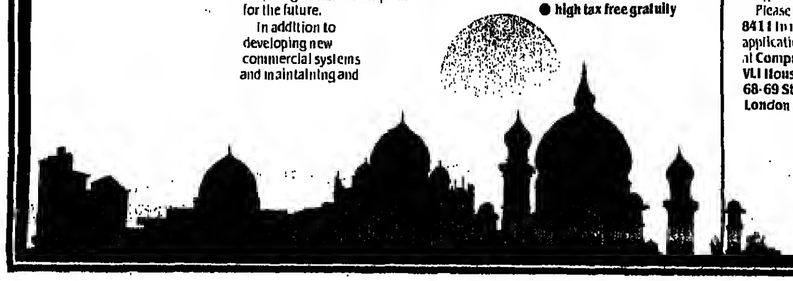
The benefits are superb and will especially appeal to the family man, keen to undertake a challenging career assignment overseas.

Please telephone **John Kelly** on **01-836 8411** to obtain more details and an application form or send your c.v. to him at **Computer People International, VLI House, 68-69 St Martin's Lane, London WC2N 4JS.**

Computer People International

## Superb benefits

- high tax free salary
- married/family status
- generous relocation allowances
- free air conditioned furnished accommodation
- company car
- 45 days leave
- annual return air flights
- generous educational assistance
- high tax free gratuity



For the

# Systems Engineer

**Seeking Real Responsibility**

**Kent** **to £13K + Bonus**

A world leader in the discovery of drugs is expanding its chemical research and development facility in Kent. They require a highly motivated computer specialist to take on the challenge of computerisation of the monitoring and control of process plant and be the focus for the planning and implementation of a new computer facility on this site.

The work will involve technical evaluation, implementation and support of research computers and frequent liaison with headquarters in Welwyn, Herts. The successful applicant will require the following attributes:

- **FAMILIARITY WITH DEC EQUIPMENT**
- **REAL-TIME DATA ACQUISITION EXPERTISE**

A competitive salary will be paid and benefits include a discretionary bonus scheme, free BUPA and life assurance, contributory pension scheme, flexible working hours and relocation assistance where appropriate.

For further information please telephone **Keith Taylor** or write enclosing a full curriculum vitae to our Reading office.

MCL **McCOURT COUSINS LTD.**

27-29 Greyfriars Road, Reading, Berkshire. Telephone (0734) 595346 (24 hours).

Chesham House, 150 Regent Street, London W1R 6FA. Telephone 01-439 8288

# PROGRAMMERS to SENIOR ANALYST PROGRAMMERS with IBM COBOL

"Where next?" We have clients in Cambs., Bucks., Herts., Middlesex, Surrey and Belgium.

They have vacancies now for Programmers (to £9.5K), Programmer/Analyst (to £10K) and Analyst/Programmers (to £11K) in the UK, and in Belgium Analyst/Programmer (to £16K), senior Analyst/Programmer (to £20K).

As well as using COBOL on their IBM mainframes, most sites currently use CICS, other software includes IDMS, UFO, ROSCOE, ETSS, etc., with either MVS or DOS/VSE.

In most cases assistance is given with relocation, a variety of other benefits is also offered.

Ring Jaff Boston on 01-930 4041 now or send your CV to him at:

Fraser Williams Recruitment & Training, 11 Charing Cross Road, London WC2H 0ES

LANCASHIRE & YORKSHIRE

## DEC Programmers

**RSTS-VMS**

Permanent or contract

Opportunities for other disciplines. Contact:

John Elton, Fraser Williams Ltd, Port of Liverpool Building, Pier Head, Liverpool, 051-227 3701

Derek Hartley, Fraser Williams Ltd, Warner Chambers House, Warwick Road, Old Trafford, Manchester, 061 877 8475

Fraser Williams Computer Services



# Each one of our Design & Development Engineers is an investment in our future.

## Add your name to the team where your contribution will be recognised.

As the world moves rapidly into a new era of communications, STC Telecommunications are meeting the new technological challenges with all the confidence of a company accustomed to leading in its field. The Engineering Centre at Basildon is involved with the design, development and detailed engineering of equipment used in telecommunication transmission networks from initial concept through to manufacture and installation. Increased investment here is part of a major growth programme to carry our expanding organisation into tomorrow's world.

Now you can add your name to the list of Design and Development Engineers working at the leading edge of communications technology – representing our investment in the future. You can join one of our small teams working on a wide variety of projects where your professional contribution will be quickly recognised and you will enjoy an unrivalled level of sophisticated support facilities. In fact, everything is geared for your success. Quarterly reviews ensure that your performance and achievements are recognised and your career is properly directed into areas of maximum benefit to both you and the Company. Our policy of 'technical stream promotion' complements normal seniority progression and takes full account of your individual special talents, moving you upwards into positions of greater scope and responsibility.

All of which is good news for experienced professional Electronics Engineers at various levels of seniority – including those with project management experience. We want people who are capable of creative thought, have a disciplined approach and are determined to build a successful career in Digital Signal Processing and Multiplex Design, Optical Systems and Network Management Systems.

If you've experience in any of the following areas, we'd like to meet you:

***High & Low Speed Logic Design, Digital Signal Processing, Semi-Custom Design, Microprocessor Applications, Application of fast Analogue to Digital Converters, Analogue Design, Electro-optic Components, Digital Systems & Networks, Switched Mode Power Supply Design, Circuit Design translation for Drawing Office, Test Models, Project Control, CAD software, Test & Planning.***

If you would like the full story on these exceptional career opportunities plus details of our generous relocation package which will enable you to enjoy living in an attractive part of Essex where there is excellent housing, social and recreational facilities, then telephone or write to: Pam Prosser, Senior Personnel Officer, STC Telecommunications Ltd., Transmission Products Division, Chester Hall Lane, Basildon, Essex SS14 3BW. Tel: Basildon (0268) 3040.

**Developing tomorrow's communications technology in an environment for technical recognition.**

**STC Telecommunications – in Basildon**

STC

# IBM OPPORTUNITIES

## ANALYST/PROGRAMMER ESSEX
## £8-10,500

Due to major expansion plans for 1984, my client, a highly respected British manufacturing Company is seeking a number of analyst/programmers to join their sales and marketing development team. Two years + IBM COBOL is essential, preferably coupled with DOS/VSE and CICS, however due to the number of posts available, CICS training can be provided. Normal large company benefits and superb prospects. Ref. EW2737

## IBM ASSEMBLER CITY
## To £12,000

Two new positions with International City Bank housing a range of IBM mainframes, GSD and DEC machines. They require a senior programmer with 4 years + experience, and a programmer with 2 years + experience of IBM Assembler, DOS/VSE and hopefully UNIPAY or financial experience. You will play an important role in their support team, with every opportunity to increase your user liaison skills. Full banking package including subsidised mortgage. Ref. EW1572.

## SYSTEMS ANALYST MIDDLESEX
## To £13,000

International marketing/retail organisation housing IBM 4300 kit under DOS/VSE with CICS and DL/1, is seeking 2 analysts with an IBM background, and 4 years + D.P. experience. You will be working on the investigation and development of a range of sales, marketing and manufacturing systems, and should have very strong personal communication skills. Full range of benefits including relocation assistance where necessary. Ref. CW2723

## ANALYST/PROGRAMMER
## To £10,500

Superb opportunity for ambitious young analyst/programmer to join this import/export company. The ideal candidate will be well-educated, with 2 years experience of IBM COBOL DOS/VSE, and possibly some knowledge of CICS, DL/1 or RPG II, coupled with plenty of drive and enthusiasm. Benefits include non contributory pension, free health assurance, 5 weeks' holiday and relocation assistance. Ref. CW2722

## PROGRAMMER SURREY
## To £9,500

12 months' + commercial IBM COBOL gained in a DOS/VSE environment, are the essential requirements for this interesting development position. You will be working in an IBM 4341, DOS/VSE, VM/CMS, CICS, UFO environment, so any knowledge of these skills would be advantageous. Current projects include payroll, ledgers, financial modelling and you will be joining a young dynamic team and rewarded with flexitime, paid overtime, free parking and staff discounts. Ref. CW2729

## PROGRAMMER/ANALYST LONDON
## To £10,500 Neg

One of the world's largest petroleum groups, has a need for programmer/analysts who can use their initiative and drive, within a structured team environment. 2 years' + IBM MVS COBOL is essential, and you will be working in a CICS and DL/1 environment with VSAM and JES 2. Plenty of opportunity to move more towards an analysis role if desired. Call for more details. Ref. CW2727

## INTERNATIONAL TRAVEL
## To £11,500

Outstanding opportunity for a programmer/analyst to utilise his or her technical and customer liaison skills within my client's U.K. and European offices. 2 years' + IBM COBOL, with MVS and DL/1 is essential, together with the ability to liaise with all levels of staff, and assist in the implementation of a financial system. Strong management prospects for the right candidate. This electronics group offer a bonus scheme, health and life insurance, and relocation where appropriate. Ref. CW2314

## SYSTEMS PROGRAMMERS
## To £14,000

We have too many positions to advertise! If you can offer 18 months' – 5 years' systems programming experience in an IBM DOS/VSE, MVS or VM/CMS environment together with any of the following: CICS, VTAM, NCP, ACF, JCL, ASSEMBLER, JES 2, we have opportunities available in London, Essex, Herts, Berks, Surrey and Kent with excellent career prospects and benefits. Worth a call! Ref. C/B 6342

## IBM PL/1 NORTH WEST LONDON
## £10,000

A large engineering concern based in North West London require an IBM PL/1 programmer analyst to join a small development team. The company house an IBM 4341 running under MVS and OS/VS and using IDMS. Applicants with on-line experience preferred although batch programmers will strongly be considered. The company offer an excellent career path for self motivated individuals. Benefits include LV's and S.T.L. Ref. GW2674

# RPG II/III

## IBM SYSTEM 34 LONDON
## c.£12,000

A senior Analyst Programmer is required by my clients, a major manufacturing concern. A large production control project will shortly be underway and the candidate chosen will heavily assist with the design and implementation of the system and will often deputise in the D.P. Manager's absence. The company offer excellent benefits including S.T.L. subsidised restaurant and non-contributory pension scheme. Ref. GW2739

## FULL RETRAINING IBM SYSTEM 38!! N. LONDON/HERTS
## To £10,000

A subsidiary of a large multi-national organisation are seeking to recruit an additional programmer/analyst with either an IBM system 34/RPG II background or an IBM System 38/RPG III programmer. Full IBM courses offered to retrain from 34 to 38. You will be developing and enhancing commercial systems and databases. Initially you will be mainly programming but you will move into a more analytical role in the very near future. If you feel you fit the bill then please do not hesitate to apply. Relocation assistance offered. Ref. GW2733

## IBM SYSTEM 38 WEST COUNTRY
## c.£12,000

Highly professional information consultancy require an IBM System 38/RPG III analyst/programmer, who is able to offer technical advice to more junior members of staff and who is able to play a leading role. The ideal candidate should have a minimum of 2 years GSD experience with at least 12 months 38/RPG III experience together with a good technical ability. The opportunity to move into management is highly likely. Full relocation assistance is offered. Ref. GW2243

## IBM SYSTEM 38 RETRAIN!!! MIDDLESEX
## £9-11,000

Due to continued company expansion, this well established and highly respected company are seeking to recruit 2 additional programmers/analysts. They have just upgraded from IBM System 34 to a System 38. Although experienced RPG III programmers would be ideal, they are quite willing to retrain good IBM system 34/RPG II people. The company are on the final stages of conversion work and thereafter will be involved with major development projects. If you can offer 18 months' GSD experience then why not give me a call to discuss these opportunities. Ref. GW2713

# OTHERS

## DEC/PDP – MACRO 11
## To £10,000 + Mort

My Client a major financial organisation based in London is currently seeking to recruit a Programmer/Analyst with MACRO 11 and RSX-11-M experience. You will become a member of a fast expanding department involved in the development of banking and accounting projects. Full training is provided, and there are prospects for advancement into analysis. Benefits include a mortgage subsidy; pension scheme, subsidised restaurant and S.T.L. Ref. AW1010

## DEC/VAX – BASIC+
## To £12,000

This dynamic London based bureau organisation would like to meet ambitious programmers with a minimum of 2 years' DEC, and BASIC + expertise. You will be immediately involved in developing commercial and financial systems, both in-house and for major clients. Hopefully you will already have had some exposure to analysis although training will be provided. Ref. AW2531.

## HEWLETT PACKARD – SENIOR
## To £15,000

A project leader is sought by this manufacturing concern, based in Berks. The successful applicant will have a minimum of 5 years' systems and programming experience, including the following: Extensive knowledge of Hewlett Packard 3000; experience of Systems Design; Analysis; Programming and staff supervision duties. They offer you the chance to head a team of highly capable programmers in the development of on-line commercial systems to an extremely high standard. The environment is challenging and the career progression into project management is likely in the future. Ref AW2267

## HEWLETT PACKARD – ANY LANGUAGE
## To £9,000

Can you offer a minimum of 6 months' Hewlett Packard 3000 experience in any language? My client based in London is seeking an ambitious programmer to take part in the on-line development of new financial systems on both HP3000 and HP250's in COBOL and BASIC. Any training necessary will be given, although it is hoped that the successful applicant will be familiar with IMAGE, VIEW and QUERY. There will be extensive user contact, and progression to analyst/programmer status is anticipated in the near future. Ref. AW1717

## HEWLETT PACKARD – COBOL
## £Neg

An exciting opportunity exists for a programmer with in excess of 1 years' HP3000, COBOL experience, to join this Berks based engineering organisation. IMAGE, and VIEW are essential as is the desire to progress into analysis. You will have extensive user contact, and be working in an on-line, development environment. An above average salary is offered and the package includes B.U.P.A., non Contributory Pension Scheme and subsidised restaurant. Ref. AW2135

## MINI/MICRO EXP
## £9,000

This rapidly expanding Surrey based company require an ambitious Programmer/Analyst with minimum of 18 months' COBOL on any machine although mini or micro would be preferred. Lots of customer support work and liaison. My client markets a special package and candidates will be required to travel initially in England and might eventually involve some European travel. Excellent prospects for forward thinking person who is looking to climb the career ladder. Ref. MW2741

## DATA GENERAL
## £10,000 +

If you have a minimum of 18 months' Business Basic programming experience and would like the opportunity to get involved in systems analysis, this London based systems house currently requires a good programmer. All development work is of a commercial nature. This position will offer the successful candidate an excellent salary and an interesting and rewarding environment within a large and diverse department offering the chance to gain experience on several different machines. Ref. MW2743

## PRIME ANALYST/PROGRAMMER
## £9-11,000

This city based chartered accountants currently require an analyst/programmer with two years' COBOL to work on major redevelopment of existing applications. All on-line work and lots of user liaison. This position would ideally suit someone in their 20-30's as it will also involve responsibility and supervision for junior staff. If you think you fit the bill and you're looking for more than a straight analyst/programmer job please contact me at once as this company will be interviewing this week. Ref. MW2742

## UNIVAC PROGRAMMER
## £8,500

First class career move for a UNIVAC programmer with a minimum of 18 months' COBOL to join this Essex based bank. My client will offer you the exceptional opportunity to retrain on banking applications when you become part of this well established team working to an extremely high standard. The total package includes subsidised lunches and full banking benefits, and you will be working on 1100 kit. Ref. MW1878

## SENIOR BURROUGHS SOFTWARE PROGRAMMER
## £12,000+

Applications are invited from Senior Burroughs programmers with in excess of five years' communications software experience. The successful candidate will also have a good basic knowledge of specialist communications, in return you will be offered a demanding but rewarding position within this Hampshire based company offering all the usual large company benefits including an excellent remuneration package and relocation assistance where necessary. REF. MW2740

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# Programmer/Analyst
## City c.£9,000

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The Company is about to embark on the implementation of the next major phase of its on-line London Market Underwriting System. This has led to the creation of a new post in our D.P. Department which we would like to fill with an energetic young Programmer/Analyst.

The successful applicant will probably have a University degree and a minimum of two years commercial programming in COBOL gained in a mini-computer environment.

He or she must also show a willingness to assume responsibility and to work with a minimum of supervision.

Starting salary will be around £9,000 p.a. Company benefits are wide-ranging and attractive.

To apply, please write under confidential cover, enclosing a detailed CV to: G. Mottershaw, Prescot Underwriting & Management Services Limited, Forum House, 15-18 Lime Street, London EC3M 7AP.

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## COMPUTER SCIENTIST

to collaborate with a team developing hardware for a data acquisition system for area detectors to be used among other applications for protein crystallography. He will be responsible for all software aspects of this project. Applicants should have a PhD in computing science and experience in operating systems, high level programming languages and compiler design for dialogue languages and for pattern recognition.

An above-average salary will be offered to the successful candidate. Certain allowances are payable in addition depending on personal circumstances. An initial contract of 3 years' duration which can be renewed, will be offered.

Please write briefly for an application form quoting reference n° 83/31 to:

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# Systems Analysts/Engineers
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Here, our team of experienced specialists are currently working on a number of real-time projects including:

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- **Engine Testing**
- **Testing of Automatic Gearboxes**
- **Programmable Controller Language Development**
- **Machine error-diagnostics**
- **Shopfloor Communications**
- **Flexible Manufacturing Systems.**

These projects are being developed on VAX, PDP11 and GA minicomputers using VMS, RSX11 and CONTROL IV Operating Systems with the applications written in PASCAL, BCPL and Assembler languages.

Our need is for men or women aged 21 to 40 with a Computer Science, Scientific, Engineering degree or equivalent, and preferably 2-3 years' experience of minicomputers in the real-time/process control field.

It will be your function after initial training to identify, design, develop and launch complete systems. You'll be expected to liaise with people at all levels and should have the potential to lead in the near future, a team of Systems Analysts/Engineers and carry full responsibility for major projects. Our projects are implemented throughout Europe and this will bring opportunities to travel extensively.

For these vacancies we are offering a starting salary within the range of £8,927-£11,833 (including supplement) negotiable according to your experience and qualifications. However, genuinely exceptional candidates with more extensive experience could be offered a salary in excess of this range.

If you have the experience and flexibility to succeed in a position which is as vital as it is challenging, write to R. H. Bryan, Room 1/578 C, Ford Motor Company Limited, Eagle Way, Warley, Brentwood, Essex CM13 3BW, or telephone for an application form on Brentwood (0277) 252149 or 253412.

Ford

(6452)

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# Select Opportunities

Our aim is to offer the very best career opportunities available. Our clients are among the best in the computer industry, covering all aspects of computing from commercial DP to leading-edge technology.

Here are some of our most urgent requirements.

## Systems Programmers/Software Engineers
## £8-£15,000

For a variety of data communications, office communications and software tools developments.
Applicants should have a degree in computer science, electronic engineering or a similar discipline, together with a minimum of two years' development experience in real-time applications.

## Software Lecturer
## Hertfordshire to £12,000

To join the education department of a prestigious minicomputer manufacturer whose current developments include networking, package switching and videotext applications.
Candidates should have a sound technical background. Previous training experience would be an advantage.

## Software Engineers—Defence to £16,000

To join a large software house currently developing a variety of real-time applications including command and control systems.
Applicants should have a degree in computing science, mathematics or a similar discipline, together with a knowledge of PASCAL, CORAL 66 or ADA. New graduates are welcome to apply.

## Project Manager Hertfordshire to £14,500

Responsible to the Systems Manager for systems development in a large food retailing organisation.
The successful candidate will be involved in the definition of new business systems, the scheduling and monitoring of current projects and software quality.
Applicants should have a minimum of eight years' experience and be proficient in the control and administration of staff.

## Programmers/Senior Programmers
## Hertfordshire £ excellent

To join a major computer manufacturer involved in the development of insurance, banking and general commercial systems.
Applicants, preferably qualified to degree level, should have a minimum of 4 years' COBOL programming experience.
A knowledge of SCREENWRITE and Honeywell hardware would be a particular advantage.

## COBOL Programmers/Analyst Programmers
## London and Home Counties £7,000 to £13,000

To join development teams currently involved in all aspects of on-line commercial applications. Current projects include:- stock control, sales database, point-of-sale and production.
Applicants should have a minimum of 12 months' experience in writing, de-bugging and testing COBOL programes on IBM, ICL, Honeywell, Philips or Hewlett-Packard hardware.

## PL/1 Programmer
## Middlesex to £8,500 + benefits

To join a life assurance society currently developing Policy applications.
Applicants should have a minimum of 18 months' programming experience preferably on IBM 4341 hardware running under DOS/VS.
Knowledge of CPG or RPG would be an advantage.

These are only a selection of the many genuine career opportunities we have on offer.

If your experience does not match any of these appointments, but you are considering a move, please call us—we may well have the right opportunity for your particular blend of skills and talent.

Contact Edith Watson, Computer Search and Selection, Hamilton House, Marlowes, Hemel Hempstead, Herts HP1 1BB.
TEL: HEMEL HEMPSTEAD (0442) 40761

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# Freelancers

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# PERMANENT OPPORTUNITIES

## MVS SYSTEMS PROGRAMMERS — to £15,500 + Car + Bonus

A Technical Systems Consultancy are currently expanding its MVS technical support group and require additional Systems Programmers with three years' + experience.
The company's philosophy is that of continuing training and growth to allow their Systems Programmer to be abreast of current software and new developments.
If you are a Systems Programmer with all-round expertise or a specialist in any area such as On-line, Database, Real-time, SNA, etc, then this could be the ideal opportunity for you.
Ref. No.: SS/59/1

## OS/VS1 SYSTEMS PROGRAMMER — to £15,000 + Perks

This major financial institution is currently converting to MVS. They require a VS1 Systems Programmer to maintain their existing operating system until the conversion is completed.
This is an excellent opportunity for a Systems Programmer with two years' experience to become involved with state-of-the-art technology, in a forward thinking organisation and help you develop new skills, especially in the communications area. For more information please call the number below or alternatively send in your up to date c.v. Ref. No.: SS/59/2.

## JUNIOR SYSTEMS PROGRAMMERS DOS/VSE — to £12,000

This multi-national company are currently seeking to enhance its technical support team. They are currently running a 4341 under DOS/VSE with CICS/DL1 and will be converting to MVS in the near future.
To qualify for this position you should have a minimum of 12 months systems programming experience. A knowledge of ASSEMBLER coupled with familiarity of SIPO is a distinct advantage.
Full training in CICS and Database will be given as well as indepth training in MVS.
For this rare opportunity please call or send in your c.v. for an early interview quoting Ref. No.: SS/59/3.

## DOS/VSE CICS SYSTEMS PROGRAMMERS — to £12,500 + Car + O/T

This is an ideal opportunity for a Systems Programmer with around three years' systems programming experience.
The ideal applicant will have indepth Assembler programming coupled with a good working knowledge of CICS and DL/1. Any exposure to VTAM would be an added advantage.
Please call for more information or alternatively send in your c.v. quoting Ref. No.: SS/59/4.

## CICS ANALYST/PROGRAMMERS — to £12,000 + Car

This go-ahead and dynamic software house is currently expanding its application teams.
They require Analyst/Programmers with a minimum of two years' programming experience coupled with a year as an Analyst/Programmer.
It is envisaged that after a short period of time that you will be able to lead small project teams.
For more information about this existing opportunity please contact us on the number below or alternatively send in your c.v. quoting Ref. No.: SS/59/5.

## CICS SENIOR PROGRAMMERS — to £12,000 + Perks

This Multinational Financial Organisation are currently expanding their CICS development teams.
To qualify for this outstanding opportunity you must have a minimum of two years' programming experience in an MVS site using COBOL and Command Level CICS.
The company are offering an excellent salary, a full range of fringe benefits which include a substantial mortgage, interest free season ticket loans etc.
For more information please contact us either by telephone or by sending in your c.v. quoting Ref. No.: SS/59/6.

## SYSTEMS DESIGNER — to £15,000

This is an ideal opportunity for a Systems Designer with a programming background to help in the design of new real-time systems.
The company are running two Perkin-Elmer machines and the programming language is FORTRAN, so any exposure to either of these will be an added advantage.
The successful applicant will probably be working in a Software House/Bureau environment and used to dealing with users.
For more information please call or quote Ref. No.: SS/59/7.

## IBM ASSEMBLER PROGRAMMERS — to £12,000 + Perks

This services company, operating in the financial sector, are currently expanding one of their software development teams.
To this end, they require, an Applications Programmer with a minimum of two years' experience of ASSEMBLER.
This company currently operate large IBM mainframes running under MVS with a host of minis and micros, so any exposure to MVS would be a distinct advantage but not mandatory as full training will be given.
For further information please contact us on the telephone below or alternatively please send in your current c.v. quoting Ref. No.: SS/59/8.

## IDMSX DATABASE ANALYST — to £14,000

This large ICL 2900 site is increasing its use of the database and to enable the planned expansion to go ahead they require a Database Analyst.
The importance of this position reflects in the salary offered. The company feel that this position is vital to their computer strategy for the forseeable future.
To qualify for this outstanding opportunity an indepth knowledge of IDMS is essential. This could be an ideal move for a Senior Analyst/Programmer to move into full-time Analysis.
Please contact us at the number below or alternatively send in your current c.v. quoting Ref. No.: SS/59/9.

## ICL COBOL PROGRAMMERS — to £9,500

This 2900 site is currently seeking COBOL Programmers with a minimum of 18 months' experience.
The company have IDMX and TPMS so any exposure to either of these disciplines would be an added advantage, but not mandatory as full training will be given.
The company have a policy of promotion from within, so career progression is excellent.
Please contact us on the number below or alternatively send in your current c.v. quoting Ref. No.: SS/59/10.

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Our modern offices are pleasantly located by the sea and in addition to an attractive salary we offer a number of benefits which include a comprehensive relocation package, generous mortgage assistance, a subsidised staff restaurant with luncheon vouchers, free life assurance, permanent health insurance and an active sports and social club.

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An opportunity exists for a **COBOL PROGRAMMER** or **PROGRAMMER/ANALYST** with sound experience gained in an IBM environment running under DOS/VSE and ICCF or equivalent. Some knowledge of CICS and DL/1 would be advantageous although use of ELIAS reduces this to minimum importance. In return for the right skills we provide a benefits package as befits a company of our stature and offer a salary substantially in excess of current earnings.

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This International Software House needs highly motivated D.P. professionals for exciting new customer support projects at home and abroad. Applicants must have 3 years' systems programming experience with a sound technical background of MVS/JES, CICS and other associated IBM software. The company is offering an excellent remuneration package together with outstanding career progression
Ref. A960

**IBM PROGRAMMERS to PROJECT LEADERS — HERTS/MIDDX — to £19,000**
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Ref: C759

**PROJECT MANAGER — LONDON — £18,000+Profit Share**
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Ref: D452

**ANALYST/PROGRAMMERS — to £18,000**
**SENIOR PROGRAMMERS/SENIOR ANALYSTS**
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Ref: C932.

**PROJECT MANAGER — £16,000+Car+Bonus**
Well-known Software House, situated in Middx, need a Project Manager with sound commercial systems and project management experience to manage turnkey systems, using MINIS/MICROS eg HP, DG, DEC equipment. The applicant will ideally have had exposure to a software house environment.
Ref: C749

**PROGRAMMERS & ANALYSTS — to £16,000+benefits**
A large number of our clients situated in London, Home/Southern Counties need Programmers & Analysts with PL1 or COBOL or BAL experience to develop realtime commercial systems, including Banking & Insurance, using CICS & DL1. Knowledge of CICS or SHADOW an advantage. Benefits include BONUS schemes, MORTGAGE & insurance facilities.
Ref: C888

**PROJECT LEADERS — MIDDX — c.£15,000+Bonus**
Major financial organisation requires Project Leaders with sound experience in the design and implementation of large scale database systems, with a working knowledge of either command level CICS or IDMS, preferably in a MVS environment. A knowledge of BAL would be useful, but not essential. Excellent career prospects and benefits apply to those key positions.
Ref: C944

**SYSTEMS ANALYST — LONDON — £15,000+**
This international company needs an Analyst with up to 4 years experience in the securities industry, to Banking or Insurance Broking, etc. An IBM background would be preferred. Very good prospects and benefits apply to this position.
Ref: C880

**D.B. ANALYST X 2 — MIDDX/LONDON — to £15,000+**
Two large financial organisations require Database Analysts with a sound knowledge of IDMS and COBOL (ICL or IBM background — Middx), or IMS and PL1, CICS (London). Positions would ideally suit a Senior Analyst/-Programmer, or Analyst. Excellent career prospects and benefits apply.
Ref: C868

**SYSTEMS PROGRAMMERS — LONDON — to £15,000**
Large international company needs someone with 3 years' experience in an IBM 4300 OS/VSE environment. Knowledge of CICS an advantage. Successful applicant would be given opportunity to travel to USA and Europe on special projects.
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**GSD ANALYST/PROGRAMMERS — SURREY — c.£14,000**
This large Software House needs 2 Analyst/Programmers with sound experience of RPG2 or RPG3 to work on a wide variety of commercial applications. A knowledge of MAARICS would be an advantage. Prospects for career advancement are extremely good for those looking for a challenge.
Ref: C933

**ANALYST/PROGRAMMERS — BERKS — to £14,500+Relocation**
This well-known commercial company requires 2 Analyst/Programmers with 2 years' data processing experience. Candidates must have reached degree level standard of education. Full training will be given on the IBM 3033/4331. Knowledge of COBOL and/or PL1 an advantage. Excellent fringe benefits include relocation package where necessary.
Ref: D317

**BUSINESS ANALYST/DESIGNER — £14,000+Profit Share**
Large financial organisation based in London, needs someone to take responsibility for developing display and information systems for their corporate finance and trading departments. The successful applicant must have merchant banking or financial systems background, preferably gained within a MINICOMPUTER environment. Experience of DEC systems would be an advantage.
Ref: C709

**BUSINESS ANALYSTS — MIDDX — c.£14,000**
Expanding Software organisation needs Business Analysts with commercial applications experience and sound MINI background eg HP, DG, DEC, etc. This position would ideally suit someone wishing to gain plenty of client involvement and exposure to a wide variety of application areas.
Ref: C746

**RPG3 PROGRAMMERS/ANALYSTS — MIDDX — c.£14,000**
Ideally the right applicants will have at least 18 months, experience of RPG3 to work on various projects within the Software House environment of a leading commercial organisation.
Ref: B689

**ANALYST/PROGRAMMERS — MIDDX/LONDON — £13,000+Bonus**
Two large financial companies need Analyst/Programmers with a minimum of 2 years IBM COBOL, preferably gained in a database environment using MVS, to take leading roles in their development plans. A knowledge of BAL would be useful, but not essential. Vacancies also exists for BAL Programmers. Excellent career path and benefits apply.
Ref: C943

**SYSTEMS ENGINEERS — KENT — c.£13,000+Relocation**
2 years' FORTRAN and MACRO 11 experience is required by this international engineering company for their software development team. The ideal applicant will have a professional qualification together with in-depth experience of CAD, systems configuration and customer liaison. Excellent fringe benefits and working conditions apply.
Ref: A708

**SYSTEMS ANALYST — LONDON — to £13,000**
Large financial organisation requires someone with 3 years' analysis experience preferably gained in an IBM MVS/JES 2 environment. The successful applicant must have taken at least 1 project from feasibility through to implementation, and will work on a variety of new commercial applications. Excellent fringe benefits apply.
Ref: D420

**PROGRAMMERS, ANALYST/PROGRAMMERS — LONDON — to £13,000+Bonus**
A number of our clients require people with a minimum of 2 years' COBOL to help develop a variety of realtime applications. Applicants with backgrounds of general commercial, insurance and financial expertise would be considered for these numerous ICL positions. A knowledge of IDMS, TP8 or TPMS would be advantageous though training will be given. MORTGAGE, LIFE ASSURANCE, SEASON-TICKET LOANS, BUPA and BONUSES are just some of the fringe benefits offered.
Ref: A/GEN

**COBOL/CICS PROGRAMMERS — LONDON — to £13,000**
Large Software/Bureau organisation needs 2 IBM COBOL Programmers to meet their expanding client requirements. Knowledge of CICS/OL1 is preferred, but training will be considered. The company offers an excellent career path through to systems/consultancy level.
Ref: C970

**SYSTEMS ANALYST — HERTS — £12,500+Relocation**
A minimum of 2 years' VME/B experience is required by this international manufacturer. The successful applicant will take responsibility for the development and implementation of new commercial applications. A good understanding of installation standards and operating systems software would be an advantage.
Ref. D883

**SYSTEMS ANALYST — MIDDX — £12,000+Bonus**
A well-known telecommunications organisation is augmented by this expanding manufacturing A.D.P. professional with a proven record of systems implementation in a commercial banking organisation. The successful applicant will be assigned to the development of new commercial applications, where every opportunity to progress into analysis will be given. A structured career path together with excellent working conditions are offered which includes a substantial BONUS.
Ref. D876

**SYSTEMS ANALYST — LONDON — £12,000+Mortgage**
Leading financial organisation needs someone with a proven record of systems implementation using ARBATS 'MONITOR' software. The successful candidate will be assigned to a highly professional team, currently developing major financial systems. MORTGAGE and BUPA are just two of the many benefits offered.
Ref. A843

**IBM PROGRAMMERS — MIDDX/LONDON — £12,000+Bonus**
This international organisation needs Programmers with a minimum of 2 years IBM COBOL and/or BAL to develop large on-line financial applications in an MVS/IDMS environment. Knowledge of CICS useful, but training will be given. Excellent career prospects and benefits apply
Ref. C942.

**CHIEF PROGRAMMER — W. MIDDX — £14,000+**
Supervisory skills to lead a team of six Programmers together with in depth working knowledge of CICS/DL1 and COBOL are required for this leading manufacturing organisation. Excellent salary and company benefits apply.
Ref: D835

**OEC PROGRAMMERS — LONDON — c.£12,000**
Our client, a leading Software Organisation, needs OEC Programmers to perform Operations Support roles within the UK and abroad. Applications include banking and other finance applications packages together with communications software and hardware support. Applicants must have COBOL, BASIC (+), or ASMS, together with good communicative skills, and be prepared for occasional worldwide travel. Experience of DEC VMS, RSX 11 or RSTS/E would be an advantage. Excellent training facilities and opportunities for advancement in a fast-growing market.
Ref. C924

**ANALYST/PROGRAMMERS — ESSEX — c.£12,000**
Our clients, a leading manufacturing organisation, require Analyst/Programmers with at least 2 years' IBM COBOL experience, together with CICS/OL1, to meet their demand for major new online development work. Excellent salary, benefits and career advancement guaranteed
Ref. B865

**PROGRAMMERS/ANALYST — MIDDX — to £12,000**
Large Software Organisation needs someone with 2 years RPG 2 or RPG 3, together with some analyst experience. The successful applicant will gain considerable experience in handling a wide variety of applications, training facilities exist, with prospects for rapid advancement in a fast growth market
Ref. C928

**ANALYST/PROGRAMMERS — MIDDX — to £12,000**
This large engineering organisation is seeking 2 PL1 and/or COBOL Programmers to go into an expanding team to work in a variety of financial applications. Experience in an MVS environment and knowledge of IMS or VTAM would be a definite advantage. Structured career path guaranteed
Ref. C927

**PROGRAMMERS, ANALYST PROGRAMMERS (TRAIN IN RPG3) — £11,500+Relocation**
A number of our clients situated in London, Home/Southern Counties require people with a minimum of 12 months' RPG2 experience to train on IBM SYSTEM 38/RPG 3. Applicants with good grounding of general commercial and manufacturing expertise would be considered for these numerous positions. PHI ASSURANCE, BUPA and RELOCATION expenses are just some of the many fringe benefits offered
Ref. A868

**PROGRAMMERS/ANALYST — LONDON — £11,500+Bonus**
Large financial company organisation needs someone with 2 years' COBOL experience to work with their development teams in an MVS/JES2 environment. A knowledge of PL1 would be useful. Benefits include BONUS scheme, FREE LUNCHES, STL, FREE LIFE ASSURANCE, etc
Ref. C969

**PASCAL PROGRAMMER — LONDON — to £11,500**
A well-known telecommunications organisation requires someone with 2 years PASCAL experience, preferably gained on DEC/VAX equipment. The successful candidate will be involved in the development of new and enhancement of existing GRAPHICS systems. Excellent career prospects
Ref. D758

**PROGRAMMER — MIDDX — £11,000+Bonus**
A leading manufacturing organisation seeks graduate with at least 2 years IBM COBOL experience, together with a working knowledge of VSAM to work on major new online development systems. Excellent benefits are offered which includes a substantial BONUS.
Ref. D245

**COMPUTER MANAGER — NORTH SURREY — £11,000+**
The ideal applicant will currently be in an ANALYST/PROGRAMMER role and will have 3 years' experience of RPG 2. Ability to be fully responsible for the commercial organisation's System 34 requires a maturity to the O.P.M. Excellent company benefits apply.
Ref. B537

**IBM COBOL PROGRAMMERS — MIDLANDS — £11,000+Relocation**
A leading Software House, currently developing new online systems, need IBM COBOL programmers with 2 years COBOL for their IBM DOS/VSE installation. A knowledge of CICS/DL1 would be an advantage. The company are offering a stimulating working environment, together with a full remuneration and benefits package including RELOCATION.
Ref. A345

**FORTRAN SPECIALISTS — LONDON/HOME COUNTIES — c.£11,000**
Programmers are required to join existing development teams to work on a wide variety of applications including scientific, research, engineering and commercial projects using mini and mainframe systems such as OEC, HP, DG, etc. Knowledge of UNIX or STATUS would be useful but training will be given.
Ref. C750

**COBOL PROGRAMMERS (ANY MAINFRAME) — SURREY — c.£11,000**
Leading manufacturing organisation requires O.P. professionals with a minimum of 2 years' COBOL experience for their IBM 4341 DOS/VSE/CICS installation. Successful applicants will be assigned into small, teams of major online commercial applications. A structured career path and associated benefits package are offered.
Ref: A677

**FORTRAN PROGRAMMER — HANTS — £10,500+Relocation**
A leading company in the field of scientific research need someone with a minimum of 2 years FORTRAN, preferably gained on HEWLETT PACKARD equipment. The successful applicant will be required to assist with planning and researching of major development project. A structured career together with many fringe benefits apply.
Ref: D497

**NCR COBOL PROGRAMMERS — SURREY — c.£10,500**
Expanding manufacturing organisation requires Programmers with a minimum of 2 years' COBOL experience preferably gained within an NCR/VRX environment. Successful applicants will be assigned to a major development project using online and DATABASE techniques. Many fringe benefits apply.
Ref. A383

**PROGRAMMERS — NORTH SURREY — £10,000+**
A leading financial organisation needs IBM COBOL Programmers for major new online development work. A working knowledge of CICS is also essential, as is the ability to liaise with Users. Very good prospects for the right people together with good benefits.
Ref. B634

**ICL PROGRAMMERS — MIDDX — £9,500+**
A minimum of 18 months' COBOL experience is required by this leading organisation. Online expertise is preferred, as is the ability to liaise with Users. A well structured career path in ANALYSIS is guaranteed.
Ref. B633

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REF. B: 01-794 5937
REF. C: 01-942 1178
REF. D: 01-310 0482

The above vacancies are only a token selection taken from our current files, and we are always pleased to hear from computer professionals wishing to further their career objectives.



# NEW MIDDLESEX-BASED COMPUTER CENTRE

## IBM 3083 — MVS/JES2, TSO/SPF, CICS and IDMS

Our client is a major international organisation operating in the Financial Information Services sector of the market on a worldwide basis, and is currently setting up a new centralised European computer centre. Decisions have been taken to develop a wide range of financial services for UK and European customers which involves the design and implementation of large DATABASE systems using IDMS and CICS as a TP monitor.

Immediate requirements are to recruit a number of key D.P. Professionals which will provide them with the scope and opportunity to make a significant contribution to the development of new major batch and online/realtime projects. Excellent career progression will be afforded to those D.P. Professionals who can demonstrate their skills and contribute towards these ambitious development plans.

**PROJECT LEADERS — c.£15,000+**
Applicants must be able to demonstrate a sound technical track record of design and implementation of large-scale batch and online database applications, with experience of IDMS or other database experience. A working knowledge of command level CICS is essential for one of the positions preferably gained in an OS/MVS/JES database environment. A knowledge of BAL would be an advantage, but not essential. Project Leaders are responsible for functioning systems and associated documentation.

**DATABASE ANALYST — c.£14,000+**
This position will suit someone with a sound knowledge of IDMS (IBM or ICL), together with a working knowledge of COBOL. The successful applicant, who will be responsible to the Database Administrator, must be able to communicate effectively at Project Manager level, and make database design decisions. Additional functions would eventually include responsibilities for staff at junior level

**ANALYST/PROGRAMMERS — c.£13,000+**
Applicants must have sound experience of IBM COBOL, together with a working knowledge of JCL preferably gained in a large-scale online database environment using OS/MVS. Exposure to analysis at design and specification level is essential. A knowledge of BAL would be an advantage, but not essential. Training in CICS will be given where required.

**PROGRAMMERS — c.£12,000+**
A minimum of 2-3 years IBM COBOL and/or BAL is needed, together with a working knowledge of JCL preferably gained in an OS/MVS environment. Training in CICS will be given where required.

If you are attracted to the challenge of these ambitious development plans, which provide the scope and opportunity for excellent career progression and benefits package, call IAN C. BUICK, MBCS, Managing Director.

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RECRUITMENT DIVISION
72 Rochester Row
Victoria · London SW1P 1JU

**Tel: 01-834 0061 (24-hours)**
Or call evenings and weekends
01-942 1178

154341

# OPERATIONS

**WANG PROGRAMMER — LONDON — to £9,500**
A leading name in the field of communications needs a self-motivated person with a minimum of 12 months' RPG2 experience gained on WANG equipment. The successful candidate will assist with the development of new commercial applications, where every opportunity to progress into analysis will be given. A structured career path together with excellent working conditions are offered.
Ref: A945

**JUNIOR IBM PROGRAMMER — SUSSEX — c.£8,000+Mortgage**
This leading finance company needs someone with 12 months' commercial COBOL experience for their expanding MIS department. The successful candidate will join an existing project team currently developing new financial applications on an IBM 4341, where training in CICS/OLT will be given. PREFERENTIAL LOANS and MORTGAGE are just two of the many fringe benefits.
Ref: A762

**CONTRACT RPG3 PROGRAMMERS — £ Contract**
Our client, based in the London area, has a requirement for a CONTRACT PROGRAMMER for a period of 8 weeks, commencing 3rd October. The assignment includes mods to a OMB system, and writing of a system for Credit Notes, where the program specs are well specified
Ref: C821

**SYSTEMS PROGRAMMER (EX-IBM OPERATIONS) — LONDON — to £13,000**
Our client, a large financial organisation is seeking an Operations Analyst or Operations Supervisor wishing to move into the realms of systems programming. The successful applicant must have sound IBM DOS/VSE JCL experience, together with experience of installing packages. A limited knowledge of PLI or BAL would obviously be a distinct advantage, together with exposure to CICS.
Ref: C888

**OPERATIONS MANAGER — ESSEX — £12,000**
This company needs an Operations Manager to take charge of a small team in an IBM DOS/VSE environment. The successful applicant must have good Supervisory/Management skills together with a working knowledge of JCL and VSAM.
Ref: C841

**OEC OPERATOR — LONDON — to £10,000+Mortgage**
International finance company needs someone with 2 years' ARBATS 'MONITOR' experience for their 2 SHIFT system. An excellent remuneration package is offered.
Ref: A898

**OPERATIONS ANALYST — SURREY — c.£10,000**
Our client is seeking an experienced Operations Analyst with sound DOS/JCL, VM experience. A working knowledge of VSAM together with CICS will be an advantage. Excellent company benefits apply.
Ref: B839

**JUNIOR OPERATIONS ANALYST — SURREY — £9,000+**
International manufacturing organisation needs someone with 2 years' MVS/JES2 and JCL experience, looking to progress into management. A structured career path together with excellent benefits guaranteed.
Ref: A882

**HP3000 SHIFT LEADERS — BERKS/KENT — to £9,000**
Self-motivated persons with a minimum of 2 years HP3000 is required by two major manufacturing organisations. Previous supervisory experience is preferred. Excellent benefits and career prospects apply.
Ref: D874

**MVS OPERATOR — LONDON — £8,600+**
Large insurance company needs an Operator with 2 years' MVS/JES2 experience. Excellent prospects and fringe benefits apply.
Ref: C866

**DOS OPERATORS — SURREY/LONDON/BERKS — to £8,300+Mortgage**
Two financial organisations and a Manufacturing Company need Operators with 1-2 years' experience with DOS/VSE to work in a 2/3-SHIFT environment. Knowledge of CICS or VM useful. Excellent prospects and company benefits.
Ref: C867

**IBM CO-ORDINATOR — SURREY — c.£8,000**
This days-only position would suit an experienced Operator with DOS/VSE, CICS experience to assume responsibilities of problem solving, trouble-shooting, liaising with Users, etc. Excellent working conditions apply.
Ref: B834

**IBM OPERATORS — LONDON/ESSEX — £6,000-£8,000**
We have been retained by several organisations to recruit Operations Personnel with 12 months' + experience of DOS/VSE or OS/MVS. Varied benefits include MORTGAGE facilities, Free Life Assurance, BUPA, etc.
Ref: B/OEN

**DATA CONTROL CLERKS (ANY MAINFRAME) — LONDON — c.£7,000**
A leading financial organisation require experienced Data Controllers for their expanding division. Excellent working conditions and benefits apply, including MORTGAGE facilities.
Ref: B656

**TAPE LIBRARIAN — SURREY — c.£6,500**
Our client requires someone to assume the role of being responsible for the maintenance of the Tape Library together with the usual job functions. Excellent working conditions and benefit apply.
Ref: B671

**GSD OPERATORS — LONDON — £6,500+**
This well-known company needs 2 Operators to work on their IBM System/34 and System/38 equipment. The ability to communicate with Users essential. Excellent career path and benefits apply.
Ref: C939

**GSD OPERATOR (DAYS ONLY) — SURREY — £6,500**
2 years' System/34 experience is required by this expanding Commercial Organisation. Excellent prospects and fringe benefits.
Ref: A941

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REF. C: 01-942 1178
REF. D: 01-310 0482

The above vacancies are only a token selection taken from our current files, and we are always pleased to hear from computer professionals wishing to further their career objectives

# your appointments register

## Programmers

| | |
|---|---|
| **NCR/IBM/COBOL** Insurance · Banking London · H Counties · N. Engl | to £15K |
| **COBOL/PL1/OS/CICS/IMS** Commercial · H Counties · Midlands · Manchester | to £13K |
| **DEC/PDP 1170** COBOL | to £11K Surrey |
| **HONEYWELL** Systems Programming experience | to £12K Middlesex/ London |
| **IBM/MVS** IMS/CICS/DL/1 | to £15K Middx |
| **SYSTEMS 34/36/38/RPG2** Insurance/Commercial London/Home Counties | to £12K |
| **IBM** Systems op | to £16K Essex |
| **BASIC** Mini/Micro Computer IBM Assembler | To £15K London |
| **IBM/UNIVAC/COBOL** On-line/Database | to £12K Surrey |
| **VAX & IBM SYSTEMS** Fortran MVS/TSO | to £11K South Yorks. |

## Analyst/Progs

| | |
|---|---|
| **PRIME CAD/CAM** Home Counties/E. Anglia | to £11K |
| **IBM 34/38/4341** London/Home Counties/North | to £15K |
| **ICL 1500/ME29/2903** COBOL | to £12½K Essex/Herts |
| **IMAGE PROCESSING C/UNIX** Scientific Applications | to £12K |

## Hardware/Support

| | |
|---|---|
| **APPLICATIONS ENGINEER** Peripherals Support/Microprocessor Systems London plus International Travel | to £15K |
| **CUSTOMER SUPPORT** Basic | £10K Hampshire |
| **SUPPORT ENGINEER** VAX 780/750 | to £17K UK & Europe |
| **EXPD. SOFTWARE TECH. AUTHORS** Datacomms/Operating Systems/Telephony/etc. | £NEG. Europe |
| **PROJECT ENGINEER** Systems/DEC | to £11K Bede/Manchester |
| **SOFTWARE SUPPORT** Medical/Training/Technical | £NEG Berkshire |

## Systems Analysts

| | |
|---|---|
| **PERKIN ELMER** On-Line/Database Systems | to £14K Middlesex |
| **CAD/CAM** Real time · Modelling | to £16K Man/Essex/South West |
| **IBM/BURROUGHS** Commercial Accountancy | to £15K London/Surrey/Manchester |
| **IBM/PL/1/DL/1** Database Support | to £11K Middx. |
| **ICL/ME29** Commercial Design | to £16K Herts |
| **IBM SYSTEM 34/38 MAAPICS** | to £13K Sussex |

## Software Engineers

| | |
|---|---|
| **CORAL/PASCAL/MASCOT/C** Communications Glos/Herts/Sussex/Midlands/Manchester | to £13K |
| **ASSEMBLER/PLM** | to £12K Northern England |
| **MILITARY SYSTEMS/RADAR** Coral · Mascot | to £14K Hants/Surrey/Essex/S. West |
| **PDP/VAX/INTEL** Telecomms · ATE | to £13K Derby/Surrey/London/Kent |
| **COMMS/TELECOMS/MOD** Mini/Mainframe | to £14K E. Anglia |
| **HP3000/INTEL** CAD/CAM/ATE | to £12K Home Counties |
| **TERMINAL EMULATORS** C/Assembler | to £15K London |

## Snr Appointments

| | |
|---|---|
| **PROJECT LEADER** Military Systems | to £15K Berks/Herts |
| **SALES EXECUTIVE** Mainframe | to £30K Nationwide |
| **CONSULTANT** Military/Defence | to £15K Berks |
| **SYSTEM PROGRAMMING** Digital/RSTS/E, BASIC | to £15K Bucks |
| **TEAM MANAGER** Computer Modelling/Fluid Flow | to £17K S. London |
| **ICL/PRE- AND POST-SALES SUPPORT** | to £16K Berks. |
| **SOFTWARE SECTION MANAGER** Pascal/C/Microprocessor | to £18K Essex/Middlesex |

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# CONTRACTORS

## IBM

IBM BYS 38 RPG III PROGRAMMERS
IBM MVS TSO FORTRAN PROGRAMMERS AND ANALYST/PROGRAMMERS
IBM PL/1 AND ASSEMBLER TSO/SPF +/- VM ANALYST PROGRAMMERS
IBM DOS/VSE PU1 PROGRAMMERS AND ANALYST/PROGRAMMERS
IBM PU1 LONG CONTRACT – IMMEDIATE START SENIOR PROGRAMMER
IBM FORTRAN 77 TSO/SPF IMMEDIATE START PROGRAMMERS
IBM DOS/VSE COBOL MACRO CICS IMMEDIATE START PROGRAMMERS
IBM VM DOS/VSE COBOL CICS SPF PENSIONS EXPERIENCE ANALYST/PROGRAMMERS
IBM DOS/OS COBOL VM DU1 CICS PROGRAMMERS
URGENT IBM MVS PU1 IMS DB/DC JACKSON ANALYST/PROGRAMMERS
URGENT IBM IMS DB/DC COBOL – ALL LEVELS
IBM IDMS DATABASE DESIGNER

## ICL

ICL IDMS DATABASE DESIGNER
ICL ME29 COBOL TME ANALYST/PROGRAMMERS
ICL VME/B IDMS COBOL PROGRAMMERS AND ANALYST/PROGRAMMERS
ICL TPMS PROGRAMMERS
ICL VME TPMS SYSTEMS DESIGNERS
ICL VME/B SYSTEMS SUPPORT PROGRAMMERS
ICL ME29 RANGE COBOL +/- MTS IDMS PROGRAMMERS AND ANALYST/PROGRAMMERS
ICL 1900 QEORGE III COBOL PROGRAMMERS
ICL 2900 IDMS SCL COBOL PROGRAMMERS
ICL 2900 IDMS TPMS VME COBOL ANALYST/PROGRAMMERS
ICL 2900 BCL COBOL ANALYST/PROGRAMMERS
ICL IDMSX TPMS PROGRAMMER/ANALYST/DESIGNERS
ICL DRB 20 CIS COBOL PROGRAMMERS & ANALYST/PROGRAMMERS

## USA SOFTWARE DEVELOPMENT ENGINEERS

INTEL 8086 WITH PLM/ASSEMBLER WITH ICE 86 OR ICE 85
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## OTHERS

CTL MODUS COBOL/CORAL PROGRAMMERS
PRIME PRIMOS COBOL PROGRAMMERS
VAX COBOL PROGRAMMERS
UNIVAC 1100 EXEC 8 COBOL PROGRAMMERS
IBM/HP3000 PROJECT PLANNING EXPERIENCE APOLLO ARTEMIS EXPERIENCE SENIOR SYSTEMS/ANALYST
HP3000 PUBLISHING AND WORD PROCESSING EXPERIENCE BUSINESS ANALYST
NIXDORF/MICRO BANKING/MICROFISCH/COMMUNICATION SKILLS CONSULTANT
HP3000 IMAGE/QUERY ETC COBOL ANALYST/PROGRAMMERS
M68000 PASCAL – PROCESS CONTROL/COMMUNICATIONS EXPERIENCE SOFTWARE ENGINEER
DATAPOINT DATABUS DATASHARE ANALYST/PROGRAMMERS
INTEL 8086 PLM/80 +/- RMX 86 PROGRAMMERS
DATA GENERAL ADS INFOS C350/M600/MV8000 COBOL (ABERDEEN) ANALYST/PROGRAMMERS
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UNIVAC 1108 EXEC 8 FORTRAN 77 IMMEDIATE START PROGRAMMERS
HP8000 IMAGE VIEW COBOL
REAL TIME PROCESS CONTROL – ANY MACHINE OR LANGUAGE PROGRAMMERS
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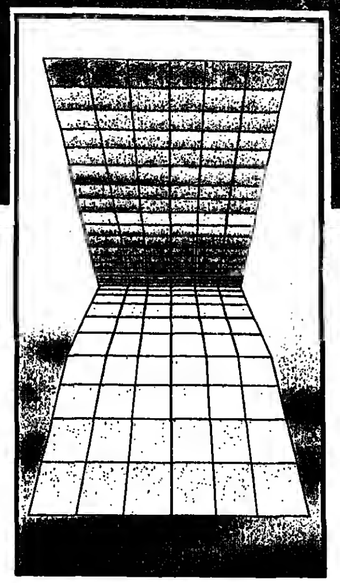

# Network Controller

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We are the Computer Services Department of a major international company. Based in scenic Worcestershire, our prestige, purpose built premises have been carefully planned to cater for the central computing needs of our company throughout the '80's. We provide a comprehensive on-line and rapidly growing distributed support service to all the company's sites throughout the United Kingdom.

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You should have the experience necessary to prepare reports, proposals and demonstrations of our systems and possess the ability to cope effectively with problem situations. A solid knowledge of terminal and comms hardware/software must be supported by the acumen to communicate effectively with user management.

This is a demanding role with excellent scope for progression to more senior positions within the company.

For further information contact our Recruitment Consultants Lesley Kingsford-Smith on **021 643 8501** or **021 353 4460** (eves/wknds). Alternatively simply complete and return the **FREEPOST** coupon to **Computer People Midlands, Alpha Tower, Birmingham B1 1BR.**

Computer People Midlands

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# MANAGEMENT & EXECUTIVE SELECTION

# SOFTWARE ENGINEERS HARDWARE

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## SOFTWARE ENGINEERS

The successful candidate will have several years' experience maintaining mini/mainframe systems, component level ability and an interest in software.

## BERKSHIRE

## HARDWARE ENGINEERS

Applicants should be fully conversant with IBM VM/MVS or VM/CMS or DEC VMS Fortran knowledge is required.

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**MANAGEMENT & EXECUTIVE SELECTION** 15438

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6423

# DPS 6
## Technical Support

**Midlands/North West** **c £13K + Relocation**

This is an excellent opportunity to join a major progressive organisation currently expanding its computer network. The successful candidate will join a small dynamic technical support team and will specialise in DPS 6 support, although there will be ample opportunity to work with a variety of other hardware/software.

Sound GCOS 6 experience is essential, ideally on a networked environment using T.P.S. In addition to good technical skills, candidates should have a broad appreciation of user needs in a complex environment.

**Rewards include:**

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All replies will be treated in strict confidence.

**For further details, please contact Barry Turton on (0270) 627206 weekdays, or Alsager (09363) 4743 during evenings and weekends, or write to him at the address below.**

Specialists since 1971 in UK and International computer & technical appointments

OCC Computer Personnel, 5 Hospital Street, NANTWICH, Cheshire (0270) 627206

# Are you a medium or heavyweight technician who's tough enough to become a champion in the CICS/DL1 class?

£8,000-£16,000

Due to our continuing growth, we need to recruit additional technical staff to join our existing teams in a number of different business areas.

We're looking for Programmers, Senior Programmers, Analyst/Programmers and Systems Designers. We obviously look for sound technical skills (in this case CICS, DL/1 or both) as well as a good educational background.

These positions will be based in our London offices, so if you have upwards of 2 years experience and think you meet our requirements outlined above why not apply?

In addition, we seek a Systems Designer/Projects Leader who will be based in Norfolk. At least 8 years experience in data processing will be required and relocation will be offered to the right applicant.

If you think you're a strong contender, why not give Louise Romain a call on 01 407 2531 both day and evenings, or send your CV to her at Hoskyns Group Ltd, 145 157 St John Street, London EC1V 4QJ

Louise Romain 01-407 2531

hoskyns



POLYTECHNIC OF THE SOUTH BANK
Borough Road, London SE1 0AA

## COMPUTER SERVICES DEPARTMENT

Three posts have been newly created in the Computer Services Department to enhance the Computer Users' Support Service provided for academic staff and students.

### USER SUPPORT MANAGER (Ref. CS10)

Salary up to £13,353 per annum inclusive of London Allowance (currently under review).

The User Support Manager will be responsible for a team of computing specialists providing a software advisory and development service offered at three separate locations. The person appointed will be a graduate, with at least five years' computing experience, including programming, and with experience of supervising computer personnel.

### COMPUTING ADVISOR (2 posts) (Ref. CS11)

Salary up to £11,638 per annum inclusive of London Allowance (currently under review).

The Computing Advisors will be responsible to the User Support Manager for the service at particular locations. The persons appointed will be graduates, with at least four years' computing experience, including a minimum of two years' programming. Experience of DEC equipment or working in a higher education environment would be an advantage.

### OPERATIONS CONTROLLER (Ref. CS12)

Salary up to £10,266 per annum inclusive of London Allowance (currently under review).

The Operations Controller will be responsible for the maintenance and development of a high level of hardware and operating efficiency for the Polytechnic computing service. The successful candidate should have at least three years' operations experience on DEC 10/VAX computers and be qualified to 'A' level standards as well as experience of setting and implementing standards for operations.

Application forms and further particulars of these posts are available from the Staffing Office. Tel. 01-928 8989, ext. 2365.

Please remember to quote the relevant job reference.
Closing date for receipt of completed application forms will be September 22, 1983.

(6362)

The Queen's University of Belfast

## HEAD OF SYSTEMS SUPPORT AND NETWORKING DIVISION

### The Computer Centre

The Computer Centre is responsible for the provision of computing services to the University for research and teaching and is currently in the process of installing new mainframe equipment consisting of a large ICL superdual 2988 system. A DEC VAX 11/780 computer is also operated together with a number of datalinks providing service from remote parts of the campus. Communications are channelled through a GEC 4160 packet-switching exchange and a Gandalf automatic exchange interconnecting local facilities, other educational establishments in the province and national centres in Great Britain.

The appointee to this senior post, male or female, will be responsible to the Director of the Computer Centre for aspects of systems, communications and networking software, for their maintenance and development and for assistance with the software aspects of advanced microprocessor applications. The head of Division will also be expected to assist the Director with the general administration and management of the Computer Centre as required.

Applicants should preferably possess a good honours degree or the equivalent in a computing related subject and have experience in effective project management.

Salary scale (Other Related Staff Grade III) £13,515-£16,826, with contributory pension rights under the Universities Superannuation Scheme. Initial placing dependent upon qualifications and experience.

Further details and application forms are available from the personnel officer, The Queen's University of Belfast, Belfast, BT7 1NN, Northern Ireland. Closing date: September 30, 1983.

(6367)

THE UNIVERSITY OF PAPUA NEW GUINEA

Applications are invited from suitably qualified persons for the post of

## PROGRAMMER

GRADE 1-2 in the Medical Library

Duties will be to work on a number of computer projects including on line library catalogue, on line searching and computer assisted learning and to advise on the use of computers by the Faculty. Experience with Prime Minis would be an advantage.

Salary Scales
Programmer Grade 1 – K14,860 p.a.
Programmer Grade 2 – K16,645 p.a.
(£1 sterling = K1.31251)

Three year contract, gratuity entitlement based on 24% of earned salary and payable in instalments or lump sum and taxed at a flat rate of 2%. Benefits include support for approved research, rent-free accommodation, family passages, baggage allowance, leave fares after 18 months' service, education subsidies; salary continuation scheme to cover extended illness or disability.

Applications will be treated as strictly confidential and should include a full curriculum vitae, a recent small photograph and the names and addresses of three referees. Applications should be forwarded to the Assistant Secretary (Staffing), University of Papua New Guinea, PO Box 320 UNIVERSITY, to reach him no later than September 19, 1983. Applicants resident in the U.K. should also send one copy to the Overseas Educational Appointments Department, The British Council, 90 91 Tottenham Court Road, London W1P 0DT, quoting reference U135/83

(6341)

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**SOUTH HAMPSHIRE** **& OTHER UK LOCATIONS** **£9,000-£11,000**

Our client provides a complete data processing service to a major UK group of companies based upon dual IBM OS/MVS mainframes with IMS DB/DC and a large teleprocessing network.

A major new IMS system is currently in the early stages of development and the company now seek to recruit SENIOR PROGRAMMERS and PROGRAMMERS for this challenging project.

If you can offer at least eighteen months IBM COBOL ideally including some exposure to on-line database software you could be given the opportunity to specify and develop new IMS batch and real-time programs. Successful applicants can look forward to a variety of commercial and manufacturing applications development.

Initial interviews for these positions will be conducted in the Hampshire area or at one of the other UK locations, but in the first instance write or telephone DP Selection Services to learn more about these opportunities, quoting reference W9151.

01-434 2042 (24 Hour Answerphone)

dp SELECTION SERVICES
7 Swallow Street, London W1R 7HD
"We look forward to hearing from you."

(5462)

### ANALYST/PROGRAMMERS
£Neg — City Based

International bank require personnel with solid IBM S34 experience, using RPGII. Banking experience is desirable but candidates with a good general commercial background will be considered. Some international travel involved together with normal banking benefits. Ref: 04/10

### DATA PROCESSING MANAGER
c £20K + car — North London

Our client, a world leader in the design and construction of on- and off-shore oil and gas installations, is seeking to appoint a manager for their MIS department.

Responsibilities will include the development of new project management systems, internal systems evaluation, customer liaison and support, together with the overall control and expansion of this progressive department.

Candidates, preferably with a degree, and at least 3 years in a similar position should demonstrate in-depth systems experience and the ability to communicate at all levels. Some experience of the petro-chemical industry and/or bureaux services would be advantageous.

An excellent salary package, together with a car, makes this highly challenging position all the more attractive. Ref: 04/09

### ANALYST/PROGRAMMERS
£14K-£18K — City/Home Counties

Software House requires four of the above urgently, with commercial, banking or financial background. Minimum of two years NCR/VRX experience, using COBOL and/or NEAT 3 level 2 and/or TOTAL, the ideal person will have all three. All projects are on new development work and very attractive salaries are being offered. Ref: 04/11

### SOFTWARE DESIGNERS/ CONSULTANTS
£Neg — Herts

A number of vacancies exist with our client, ranging from Senior technical design consultants to designers with only 18 months experience. The company manufacture Process Control systems and would therefore like to interview people with this or related experience. Ref: 04/12

### COMMUNICATIONS SOFTWARE DESIGNERS
£Neg — Beds

Multinational computer manufacturer have a wide range of vacancies for experienced comms designers with the following experience: X25, HDLC, SNA, Multi-processor S/W, network control. Knowledge of Viewdata, Videotex or similar is desirable. Ref: 04/14

### ANALYST/PROGRAMMER and PROGRAMMER
£Neg — W. London

A well known pharmaceutical company are looking for IBM, COBOL, CICS/DL1 people to join a small development team. General commercial background is desirable. Salaries are dependent on experience. Ref: 04/13

Take this opportunity to discuss these and other requirements by phoning Hitchin (0462) 57141 or write to:

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# Stability returns to the Midlands

**Many companies are looking to the end of the recession and brighter job prospects . . . Jacqueline Moore reports**

EXAMPLES of many of the UK's vital industries can be found throughout the Midlands. Within each principal town the car manufacturer, electrical engineer or computer maker has built its factories and offices.

In each large firm and in many smaller concerns the data processing department has become indispensable, and although the department's fortunes have varied with the fortunes of industry over the past two years of recession, most now report a newfound stability.

Car manufacturing and its associated industries have suffered visibly from the country's economic unrest, with difficult staff/management relations, increasing foreign imports and redundancies. But there is a hint of optimism.

John Creswell, operations manager for Talbot Motor Company in Coventry, says: "The situation is stabilising. The last 12-18 months have been a problem."

In a computing department at Talbot with 110 staff there are no vacancies at present, but Creswell says optimistically: "There is a possibility I may take on staff."

Those who leave for other jobs or to enter retirement, he says, will probably be replaced.

This has not been the case for some other companies in recent months. Rolls Royce Motors, in Shrewsbury, has had to make about five staff redundant in one sector where it was decided to subcontract the work out.

The company has also been unable to run its training scheme for school-leavers this year. But Tony Parsons, senior training officer for Rolls Royce, hopes the company will reinstitute the scheme next year.

"This year, we didn't put anyone on the scheme," he said, "but we'll be interviewing in February/March hopefully for staff to take on in 1984."

The outlook for graduates and trainees is brightening more rapidly than prospects for other members of staff. The Rolls Royce course in Shrewsbury enables school-leavers with A-levels to be sponsored on sandwich courses at a university or polytechnic.

"We offer five sponsorships," says Parsons, "mostly for mechanical engineering, but some go into computing later."

The courses normally last for four years, during which the students are members of staff. After this, adds Parsons, "we like to give them a permanent place."

Talbot Motor in Coventry also offers positions to graduates. Says Creswell: "We take on some graduates – about three a year. We tend to have an in-house progression policy, promoting the young people we take on."

Peter Roe, head of the computer information division at Fisons' Pharmaceutical Division in Loughborough, Leicestershire, also likes to fill vacancies with graduates. "We tend to take on graduates in the development area," he says, although recruitment has been very slow recently. "We would not automatically recruit anybody at the moment."

Fisons, which has 47 computing staff in operations, technical support and systems support, also invites local students to work at the company for a set period in order to gain professional experience.

Graham Clarke, operations manager at Fisons Pharmaceutical, explains: "A number of times we've had people from local technical colleges who come on a sandwich course basis." This usually carries on for a period of one year.

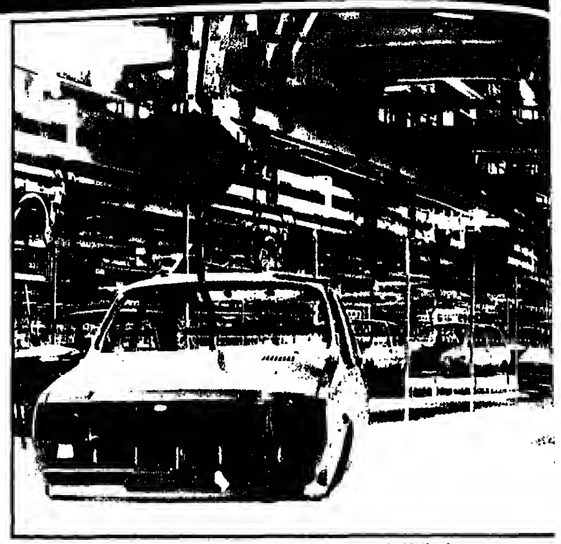
"We normally have at least one person from the college," Clarke adds.

Applied Computer Techniques has been recruiting both graduates and experienced members of staff in the Midlands. There have been vacancies in all areas, including technical, sales and programming.

Job prospects for experienced staff are not all gloomy. Most companies say that they will require experienced computing staff when vacancies occur.

Terry Hughes, data processing officer for Britannic Assurance Company in Moor Green, Birmingham, which has mainly ICL systems, says he takes on a majority of people with experience.

Britannic has about 25 staff in systems and programming and, says Hughes, the situation is "quite stable and will continue so".



*A hint of optimism for the car manufacturing and associated industries in the Midlands.*

Keith Wigley, data processing manager with Rolls Royce Motors in Shrewsbury, echoes this. "It will be some time before we're recruiting," he says, "but we'll probably need people with specific skills." The company has an IBM 4331.

At Talbot Motor, John Creswell suggests that when he tries to fill a vacancy, he cannot always find suitable recruits.

"We do look for experienced people," he says, "but we don't always find them."

Talbot has several different types of computer, including systems from Amdahl, IBM and NCR.

A spokesman for Lucas' recruitment department in Shirley, near Birmingham, says the company takes on all kinds of people, including experienced staff, graduates, people from government training schemes and non-computer candidates from other areas, who are then trained up.

Numbers of vacancies are not available, he adds, because Lucas is a decentralised company, with each division, such as Lucas Electrical or Lucas Aerospace, dealing with its own recruiting.

Recruitment is currently subject in this part of the economy. Several company spokesmen suggest that although they are willing to give details of current vacancies it could be harmful to say that there is no hope for applicants.

"After all," said one, "we can change rather dramatically."

After working in a restricted training environment for a few years, most computer staff are able to take on new skills and expand as soon as they are given such action to the accounts departments.

As Peter Roe of Fisons says: "We would always like to have fresh blood."





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**EDUCATION DEPARTMENT (LIBRARIES AND MUSEUMS SERVICE)**

### COMPUTER SERVICES LIBRARIAN

**Grade SO1/2 £9,060 to £10,535**

Sandwell Library Service is considering the introduction of an integrated stand alone on-line computerised system for circulation control, stock ordering, acquisition and cataloguing. The postholder will be responsible for the necessary investigation of the project and implementation. It is anticipated that the appointment will initially be for a period of three years.

Applicants must have considerable experience in staff management and public library computer operations at a senior level, together with the ability to plan, organise, negotiate with suppliers and effectively manage a project of this nature.

A thorough knowledge of public library systems and developments in the new technology is required, together with the ability to work under pressure. Minimum qualification for this post is Associateship of the Library Association, or appropriate equivalent.

Closing date: 7th October, 1983.

Requests (quoting Ref. No. 486 and enclosing S.A.E.) for application forms and further details should be made to the Personnel Officer, Town Hall, West Bromwich B70 8DX. A Union Membership Agreement is in operation. Canvassing of members of the Authority will disqualify. (5480)

## University of Birmingham

Centre for Computing and Computer Science

### COMPUTER OFFICER

Applications invited from graduates with relevant academic, industrial or research experience for a post of Computer Officer within the User Services Group of the Centre. The Group is responsible for Applications Software and user guidance and in addition to these duties the appointee will have special responsibilities in the area of liaison with external services in particular with users of the recently installed Cyber 203 System at UMRCC.

Salary according to age, qualifications and experience will be on the Computer Officer scale £6,310 – £11,615) – £14,125 plus superannuation.

Further particulars from Mrs J. E. Butler, Senate Division, The Registry, University of Birmingham, P.O. Box 363, Edgbaston, Birmingham B15 2TT, to whom applications (3 copies), including full Curriculum Vitae – naming three referees should be sent by Friday, 7th October, 1983.

Please quote ref. no: CW1 (5447)

## SENIOR OPERATIONS ANALYST (COMMUNICATIONS)

**£9,657-£11,136**

To undertake responsibility for the Council's teleprocessing network, including equipment installation, problem resolution, reliability/performance monitoring and the establishment of job control/security and operations procedures. The work will involve considerable technical liaison with Systems Development staff and the provision of advice and guidance to users.

We operate a 4mb IBM 4341/2 with an STC 3805 using MAF software to control a network of 100 terminals. VM is the host environment for both DOS/VSE using CICS and DL1 and CMS facilities such as APL and ADRS. Applicants must have a minimum of 4 years' operations experience including at least 2 years' working on communications networks and possess a high level of technical expertise in the communications field.

If you are an Operations Analyst/Network Controller seeking responsibility, then contact Allen Chambers, Data Services Officer on 01-303 7777 Ext 782, or write to The Data Processing Manager, D.P. Department, 9 Brampton Road, Bexleyheath, Kent DA7 4EZ. Closing date 22.9.83.

Bexley (5374)

## Manager

### Information Technology Centre PO1b – £11,364-£12,738 p.a.

The Worcester Information Technology Centre, which is sponsored by Hereford and Worcester County Council, is seeking a Manager to lead a team to organise and run this challenging new project.

The Centre will provide twelve months' training and work experience for thirty young unemployed people in electronics, microprocessing, computing and electronic office skills. In addition the Centre will develop saleable IT products and will be accessible to the local community.

The Manager will be responsible for setting up the Centre, designing and implementing an appropriate training programme, promoting the Centre's facilities, and testing and developing ideas for new products. He/she should have qualifications and experience in the information technology field, preferably at managerial level.

Further details and an application form may be obtained from The County Careers Centre, County Buildings, St Mary's Street, Worcester WR1 1TW. Telephone: Worcester 353366 ext. 3466. Closing date: September 23rd, 1983.

**County Council of Hereford & Worcester** (5427)

## MANNS

A regional operating company of Watney Mann and Truman Brewers Limited requires a

### DATA PROCESSING OPERATIONS MANAGER

to be based in Northampton

Responsibilities will include the efficient and economical management of the department along with the provision of a comprehensive data processing service to the company using three Data General mini computers with communications links to an IBM mainframe computer.

If you have experience in this field, are educated to a high level and are aged between 25 and 45 then we would like to hear from you.

The salary and benefits are as you would associate with a major company and applications should be made to: Mr C. C. Pollard, Manns Northampton Brewery Company Limited, PO Box 22, Lodge Way, Harlestone Road, Northampton NN5 7UU, stating relevant experience and current salary (5497)

## THE BRITISH COUNCIL

### The Centre for Computer Studies Ngee Ann Polytechnic Singapore

Director: Rodney Shaw MA BSc CEng FBCS FIMA

Two ACADEMIC STAFF are required for January 1984, to support the continuing development of the CENTRE FOR COMPUTER STUDIES which was established in September 1982 within Ngee Ann Polytechnic, Singapore. The Centre's principal function is to provide a HND in Computer Studies course with an annual intake of 200 students.

**Duties and Qualifications**

Candidates should be capable of lecturing at HND level and able to offer one or both of the following specialist areas:

**Programming using Cobol**

**Systems Analysis and Design**

Candidates should be academically well-qualified with appropriate professional and lecturing experience.

**Terms and Conditions of Service**

A generous package of salary plus allowances, including accommodation and children's schooling, will be negotiated with each successful candidate. Contracts will be initially for two or three year periods of appointment. Salaries up to £20,000 per annum are available for senior staff appointments.

**Applications**

Further particulars of the posts and application forms may be obtained by telephoning 01-580 6572, extension 41, or writing to Overseas Educational Appointments Department, The British Council, 90-91 Tottenham Court Road, London W1P 0DT, quoting reference ASS 132-133. The closing date for applications is 27 September 1983 with interviews taking place in London during the middle of October. (5369)

## MINI & MICRO-BASED CONTROL SYSTEMS

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### REAL-TIME PROGRAMMERS

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Experienced programmers are required for the development of software for a variety of projects using DEC minis and various micro computers. The projects include **advanced production control and materials handling systems, and systems for engineering and security applications.**

We are interested in hearing from committed programmers with mini and/or micro real-time systems experience, or **people with good general programming skills wishing to advance their careers.** You will join an expanding DEC systems and software house with a fast developing Special Projects Group and must be able and willing to work on occasional single person projects or as members of a team.

Rewards in terms of the variety of work and the opportunity for the projection of effort, are equalled by the prospects for excellent career and salary advancement for the right people.

Applicants should write with C.V. or request for an application form to Digby Dyke, Managing Director, at the address below, or telephone him on Worcester (0905) 611512 office hours or Malvern (06845) 2210 evenings and weekends.

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## ANALYST PROGRAMMER

**OXFORD** c. £9,500

Our clients are part of a highly successful multi-national health care company. They require a professional ANALYST PROGRAMMER with around 18 months' experience to work on the development of commercial systems using an IBM S/34 with RPGII and COBOL. An excellent benefits package including relocation and p.p.p. is available for the successful candidate.

## SYSTEMS ANALYST

**COVENTRY** c£11,000

In return for your experience of the BASIC language, however limited, one of our clients in the Coventry area are looking for a Systems Analyst with a minimum of five years' D.P. experience in either Manufacturing or Financial Applications. They are seeking sound business analysis rather than technical systems experience. This is an up and growing company with a full order book.

## ANALYST/PROGRAMMER

**WEST MIDLANDS** c.£9,000

If you are an Analyst/Programmer with strong experience in a manufacturing environment then here is your opportunity to move into an IBM GSD installation. Our clients are looking for someone with this applications background and will train the successful person in the RPG III language and the IBM utility MAAPICS.

## SUPPORT ANALYST

**BIRMINGHAM** c.£9,000 + car

A leading OEM in the micro computer field is looking for a sales support analyst to take charge of their Midlands operation. Experience of the BASIC language is essential, and the preferred applicant will have worked for another manufacturer or dealer in a support role. Experience of the DEC range of hardware would be ideal.

## ANALYST/PROGRAMMER

**BIRMINGHAM** c.£9,000

One of the leading service companies in the Birmingham area are looking for new analyst/programmers to supplement their D.P. department. Strong Analysis skills are required, as well as experience of the language BASIC. The hardware used is the DEC VAX system, though experience of this particular machine is not essential as the company will train the successful applicant in the relevant software.

For any of these positions or other Midlands opportunities please call KEAVAN YOUNG in BIRMINGHAM as soon as possible.

TCR **Targa Computer Recruitment**

## Bostik

### A chance to use your COBOL analysis skill

Here at Bostik, one of the UK's leading manufacturers of adhesives and sealants, we are in the process of expanding our DP facilities particularly in the field of on-line systems. We utilize an ICL ME29 with a small DRS 50-based local area network and extensive terminal equipment.

We are looking for a mature person with an ICL background and experience. Preference will be given to applicants with systems analysis/design experience, and if you are familiar with on-line business systems, so much the better.

We offer a competitive salary and first class conditions of employment in an excellent working environment.

To arrange an informal interview, please contact Mrs. Mavis Barratt, Personnel Services Officer, Bostik Limited, Ulverscroft Road, Leicester. Telephone No. 50015. (5493)

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## BOX NUMBERS

Box number replies should be addressed to:

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Quadrant House, The Quadrant
Sutton, Surrey SM2 5AS

**THE UNIVERSITY OF ASTON IN BIRMINGHAM**

### ANALYST/PROGRAMMERS

Exciting and interesting new developments including networking, modelling and on-line systems give rise to two new posts in the Administrative Data Processing Unit. The Unit provides a full computer service in the Central Administration based on an ICL ME 29 installation and is involved with a Library system to be implemented on a GEAC 8000 computer.

Successful candidates will have experience of integrated on-line systems and programming experience in COBOL. However the appointment of a candidate with a good academia background and little experience may be considered.

Salary – OTHER RELATED 1A – £7,180 to £11,815 per annum.

For further detailed particulars together with application form please contact Mr. A. G. Rose, University of Aston in Birmingham, Gosta Green, Birmingham B4 7ET (021-359 3611 Ext. 4572) quoting reference 83/63/CW.

Closing date for applications September 26th, 1983. (5458)

**UNIVERSITY OF LEICESTER**

Computing Studies Unit

### LECTURER IN COMPUTING

Applications are invited for a post of Lecturer in Computing in the Computing Studies Unit. Applicants should have experience in some branch of non-numerical Computer Science, and have suitable postgraduate or industrial experience.

Initial salary will depend on qualifications and experience on the Lecturer's Scale £7,190 to £14,185.

Previous applicants for this post will be reconsidered and need not re-apply.

Further particulars from the Registrar, University of Leicester, University Road, Leicester, LE1 7RH, to whom applications should be sent on the form provided by: October 7, 1983. (5316)

**LEICESTER POLYTECHNIC**

### A COMPUTER SYSTEMS TECHNICIAN

is required to work in the school of mathematics, computing and statistics.

The Computer Systems Technician will build, renovate and maintain laboratory hardware and provide technical assistance to students in the laboratories.

It is expected that the successful applicant will have an HNC or HND qualification. Salaries will be in the range £6640 to £8135 per annum.

Further details and application forms available from the Personnel Officer, Leicester Polytechnic, P.O. Box 143, Leicester LE1 9BH. Tel: (0533) 551551 Ext 2303. (5400)

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# Sphinx could be the answer to the riddle of your future.

Sphinx is a rapidly growing, dynamic company, marketing professional microcomputer software.

As a direct result of our success to date and in order to help us maintain our exciting programme of expansion, we wish to receive applications from suitably qualified and experienced personnel to fill the undermentioned senior positions.

## UNIX specialist

This position is in the Consulting and Training Department of Sphinx. The Department is staffed by experts who provide highly specialised services in the areas of consultancy and training in the UNIX world.

Applicants should have an in-depth UNIX knowledge as well as a good understanding of the computer industry in general. You must also be articulate and a good communicator.

The position provides opportunity for some overseas travel.

## Software Sales

(reporting to Software Sales Manager).

The job demands that you sell Sphinx software products and services to Dealers and End Users.

Areas of responsibility will be clearly defined but within these you will be expected to show professional selling skills, initiative and enthusiasm.

Proven sales experience and an understanding of the software systems market are essential.

## Pre-sales Software Support

(reporting to Software Sales Manager).

The position requires you to support the sales team in selling software products to Dealers and End Users. It means, therefore, that the successful applicant will occupy an important position as a positive interface between the product technical staff and the commercial sales force.

An understanding of UNIX is essential and DEC experience would be an added advantage.

The structure of the company will allow career development in the direction of sales, consultancy or training.

## Business Software Support

Applicants should have a knowledge of business languages such as COBOL, DIBOL and BASIC.

You will be part of a small team who specify, evaluate, document and support software under the UNIX operating system.

Experience with business applications under a multi-user operating system is essential.

Sphinx offers excellent career development prospects and the remuneration packages, plus car where appropriate, reflect the importance of the positions.

Interested applicants should submit their CV to:

Mrs. H. Smith,
Sphinx Limited, 43-53 Moorbridge Road,
Maidenhead, Berks, SL6 8PL
Tel (0628) 76343.

SPHINX

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# LET YOUR HIGH TECHNOLOGY CAREER GROW IN THE GARDEN OF ENGLAND

## SALES PEOPLE – 20K Plus

Micro Technology are looking for intelligent, articulate individuals with a proven record of success in the sale of micro computer-based systems. As authorised dealers for the IBM PC we need your help to make the most of the opportunities available in this pleasant part of England. The reward for hard and successful work includes a package of 20K plus, a company car, private medical insurance and four weeks' annual holiday.

We offer a unique opportunity to sell first class systems from the world's best known computer manufacturer to a large and responsive market.

We are also looking for:

## HARDWARE ENGINEERS – To 10K

To install and maintain mainly IBM-PC and Z80-based systems. Training will be given on specific hardware. Knowledge of micro-based systems and electronic/electrical qualifications are essential for these positions.

## PROGRAMMER – 7 to 12K

To develop and install a micro-based software distribution system. The successful applicant will be familiar with 8080/Z80 and CP/M. Knowledge of 8086/8088 and MS-DOS/PC-DOS would be useful but not essential. Proven ability would be considered as being more important than formal qualifications for this position.

## SOFTWARE CONSULTANTS – To 12K

To support our successful sales team in researching, demonstrating and installing the latest in software available on the micro systems we sell. Knowledge of micro applications packages and the MS-DOS or CP/M operating systems will be a distinct advantage. A degree in computer or business related studies would be useful for this position.

If you are interested in joining a successful young company and growing with us, please write to us, or alternatively phone David Owens on 0892 45433.

MICRO TECHNOLOGY LTD., 51 THE PANTILES
TUNBRIDGE WELLS, KENT

IBM AUTHORISED DEALERS FOR THE IBM PERSONAL COMPUTER

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# Senior Systems Analyst

for a challenging new DP operation

There can be few more interesting tasks than to be involved in the setting up of a completely new DP Operation. And when that operation is within a fast growing, highly progressive Company, then the prospects are all the more exciting.

Océ is a well established, successful Company and part of a Dutch based International group. Our range of top quality plain paper copiers has put us amongst the leaders in this highly competitive market. Now in order to increase still further our operational efficiency, we are setting up a fully integrated computer system covering all aspects of the Company's business especially in Sales, Marketing, Finance and Administration.

The successful candidate will be responsible for carrying out a detailed analysis of systems requirements and also be involved in establishing the Company's DP function. As a senior member of the development team you will work in close conjunction with the Systems Manager and will be responsible for project leading and installation of various systems.

The position calls for five years DP experience of which at least two years must be in systems analysis.

Coupled with this must be the ability to work within a team as well as on your own initiative. A background in O & M would be an advantage.

A salary in the region of £12,500 will be offered together with an excellent benefits package and the opportunity to build a career with a fast growing organisation.

*Please send a detailed cv or telephone for an application form to the Personnel Manager, Océ Copiers (UK) Limited, Langston Road, Loughton, Essex. Telephone: 01-502 1851.*

océ

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DIRECT ADVERTISERS (01) 661 8080

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# COMPUTER CONTROLLER

A commercial group comprising several companies based in Sevenoaks, Kent, is seeking an individual to take control of their computer division. The group currently operates an NCR 9020, 256k memory, 54mb disc drive. Applicants who are experienced computer programmers with operational systems background, currently earning not less than £8,000 p.a., should apply in writing with c.v. to:

Mr. R. W. B. Morton
Harris and Dixon Ltd
Wimbourne House, 136 High Street, Sevenoaks

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# Advanced Computer Development

## Location; to the North of London: Large IBM environment

Our client is a major IBM user. Their International Data Centre Headquarters is based to the North of London. Because of changes they now wish to fill the following vacancies.

### Systems Programmer
### (Salary c. £14,000 p.a.)

We are looking for someone with at least 2 years' systems programming experience who during that time will have worked in an MVS/SP environment. The position is particularly attractive as it offers not only the opportunity to support software and hardware in the United Kingdom but also internationally, and will certainly involve some overseas travel. Successful applicants will probably be graduates who will be committed to working in the Systems Programming area.

### User Support Specialists
### (Salary c. £12,000 p.a.)

These are particularly interesting positions. The successful applicants will have a good knowledge of programming and IBM software and will play the role of the "Systems Engineer" resolving user reported software problems, advising users on how to best utilize current software. At the same time they will ensure that users are aware of new products within this important area.

### APL Specialist
### (Salary c. £12,000 p.a.)

We are looking for someone with a good knowledge of APL and perhaps TSO over a period of 2 to 3 years. The position will attract someone who has worked within the computer service industry or a large user. Personality and communication skills are very important as there will be considerable contact with users at all levels.

### Capacity Planner
### (Salary c. £14,000 p.a.)

The company has installed the latest CMF package and experience of forecasting user computer demand would be a considerable asset. A broad knowledge of IBM hardware and software is obviously essential PLUS the ability to use modelling tools and inquiry facilities such as APL, EASYTRIEVE and SAS. However, it is also important to have the ability to work on one's own, generating confidence with users, whilst maintaining a high degree of inventiveness and initiative. The position will involve some European travel.

Our client offers an excellent range of benefits and where necessary there will be relocation assistance.

To apply, please telephone Jane Jones today or write to her at: A&A Consultants (Holding) Ltd., County House, 10 Little Portland Street, London W1. Tel: 01-631 4184.

A&A

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# SIX OF THE BEST

## [illegible]

[illegible]

An opportunity exists within a well established and [illegible] capable and experienced programmer to move into a team leader [illegible]

The successful applicant will head a team of eight programmers (and there are plans for further expansion) currently involved in the development of major new on-line accounting systems.

Three or more years solid IBM COBOL programming is essential, as is previous experience of supervising other programming staff. This is a key position and career prospects are excellent for the right person. Reference: [illegible]

## Senior Systems Analyst

[illegible] Circa £14K

Our client is an international organisation offering a world-wide information service. As part of a programme of expansion and development, they are seeking an individual who can demonstrate several years experience of major development assignments, preferably on both large mainframes and on mini-computers.

The successful applicant will be expected to assume responsibility for one or more systems, should be highly motivated and capable of dealing with users and management at all levels. A career path into senior management is envisaged. Reference: [illegible]

## VME Support
## Salary circa £12K

South of the river amid the parkland of London lies an organisation looking for you. You've been buried in the backroom supporting VME and your knowledge of COBOL (and hopefully Plan1) is going to waste.

Get involved in the latest ICL software tools and expand your skills into communications as a support programmer within this dynamic and progressive organisation. Reference: SI/3

## Systems Programmer in Hertfordshire
## £10K + negotiable

We are a major Insurance organisation with an expanding DP Department, looking for a young enthusiastic systems programmer to join a team involved with the development of computer systems.

You should have four years' DP experience, two of which should have been in Systems Programming based on IBM mainframe ideally 4300.

Knowledge of two of the following is essential: VM, OS/VS1 and CICS. A background of COBOL or Assembler would be desirable.

The company are planning to migrate to MVS and DL1 within the next two years and a knowledge of this would be considered favourably. There are generous fringe benefits. Reference: WC/4

## DEC/Programmers to £11K London

Would you like to work for the most successful consultancy in the world? Just two years' Basic + two programming experience on DEC 11/70/34 will interest this company. They need confident, capable people who are technically sound and want to develop their career rapidly.

Abilities in areas of client liaison and support are essential as you will be based on clients' premises for the greater part of these major development projects. Reference: S H.5

## Probably the most challenging installation in Hampshire
## Salary Circa £11½K

We are talking about commitment, two way commitment.

An International financial service group offers totally committed professional COBOL Analyst Programmers a golden opportunity to produce the goods within their dramatic expansion programme.

A minimum of three years' IBM COBOL experience is essential in addition to knowledge of structured techniques. Don't worry if you live in the Midlands or the North. If you are the right person for the job our client will pay relocation in full in addition to a whole package of generous fringe benefits. Reference: WC/6

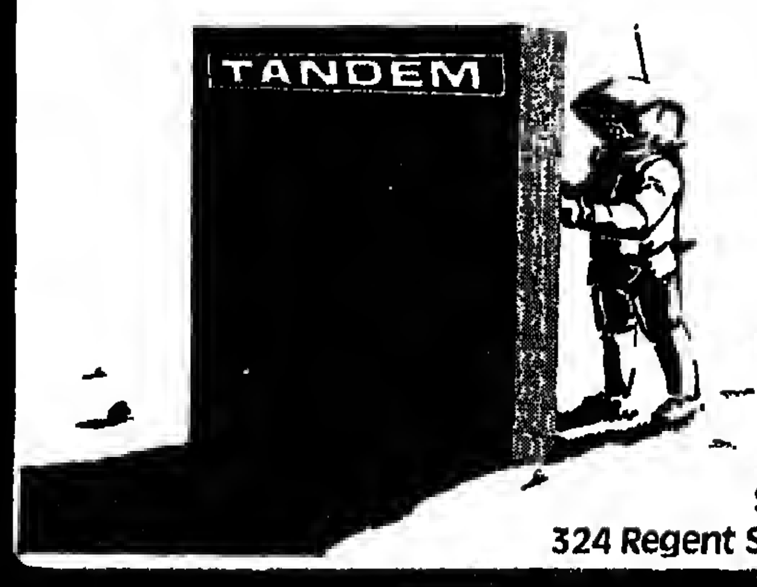
For more details telephone 01-734 7394 or Post the coupon (no stamp required) to Warwick Woodward, Freepost 37 London W1E 6UZ

WARWICK WOODWARD
A SPAN GROUP COMPANY
43-44 GREAT WINDMILL STREET, LONDON W1V 7PA
TELEPHONE: 01-734 7394
24 HOUR ANSWERPHONE

I am interested in ref no ☐
Please send me an application form ☐
Name
Address
Tel (h) (w)
Job Title

# MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611




## £9-£10K + O/T + S/BY + 2-litre CAR

Tandem Computer Inc. was founded in 1974 to meet the market need for reliable, fault-tolerant, interactive data processing systems. Today more than 2,500 Tandem systems are in use in more than 25 industries worldwide.

With a unique system design, superior technology and personnel, Tandem has every reason to anticipate continuing success and aggressive growth in the future.

Customer engineers wishing to be part of this success are required in **LONDON, HOME COUNTIES AND DUBLIN.**

Tandem's trouble-shooting philosophy is a sophisticated mix of hardware and software involvement, therefore, successful applicants will possess not only three/four years' experience maintaining large mini/mainframe systems, but also an interest in software.

Training is on-going but is initially for two months in Germany/America. In addition, earnings will be £12K-£14K first year, a 2-litre car is provided and stock options, PPP, 24 days' holiday are just some of the excellent benefits offered.

*Tandem offer a genuinely interesting and rewarding career. To discuss this opportunity call Chris Bond or Phil Joisce on 01-637 9611.*

TANDEM

Suite 201/6 Albany House
324 Regent Street London W1R 5AA 01-637 9611

**MANAGEMENT & EXECUTIVE SELECTION**

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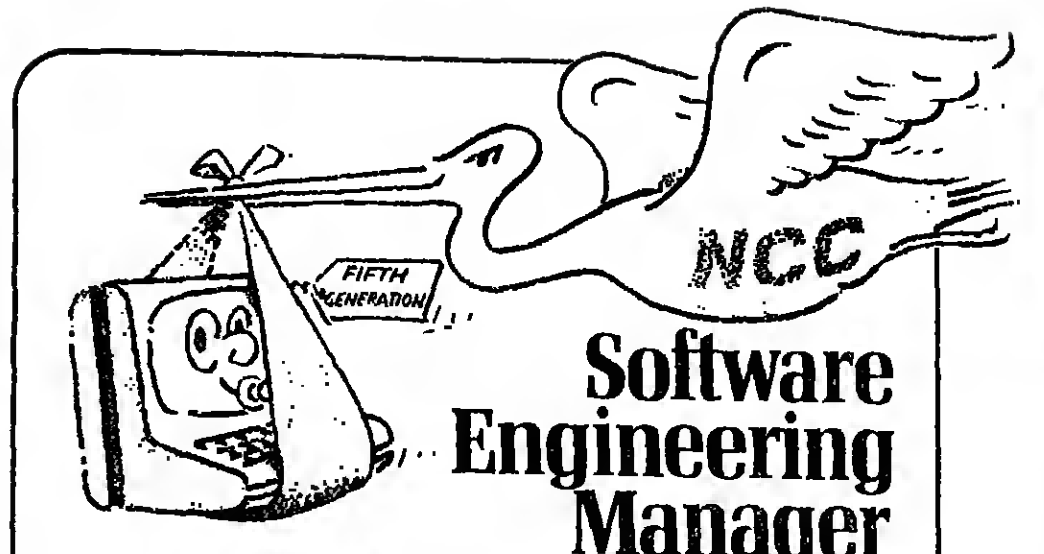


# Software Engineering Manager

## Manchester

The National Computing Centre has wide responsibilities for the promotion of effective computing in the United Kingdom. To meet the challenge and change of the future we have created a new post of Software Engineering Manager.

We are seeking an innovative real-time software engineering specialist to lead the Centre's investigations into forward looking developments and its contribution to national initiatives in this sphere. The task will be to determine the parameters of the work to be undertaken, to create the team, to liaise with other organisations in the field and, subsequently, to ensure results are made widely available and utilised within the UK computing community.

The successful candidate, male or female, is likely to be in the 30–40 age group, of high intellectual calibre with a record of successful involvement in Software Engineering.

Salary: Initially, within a range up to £19,000.

Conditions of service are excellent.

Please write as soon as possible with your career details indicating why you believe you have the technology, the leadership and personal skills to make a significant contribution to our post, to:

The Personnel Manager,
THE NATIONAL COMPUTING CENTRE LTD.,
Oxford Road, Manchester M1 7ED.
(Or telephone 061-228 6333 for an application form).

**NCC**
The National Computing Centre

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MANAGEMENT OPPORTUNITY WITH TOP BRITISH MICRO MANUFACTURER

# MICROCOMPUTER MARKETING

## MARKETING MANAGER - INDIRECT SALES
## £17K to £20K + BENEFITS PACKAGE, OXFORD-BASED

**A key factor in Research Machines' success is its product policy which focuses on the concept of microcomputer networks and is backed by company-wide commitment to product quality, performance, and reliability. The high level of sales achieved throughout the educational sector by our 480Z system is a conspicuous example of this.**

The next phase of our marketing plan is to bring the 480Z to a wider audience via indirect sales — primarily through dealers, but also through OEMs and systems houses. This represents a significant development in marketing strategy for a company which has previously concentrated on direct sales to end users.

We are now looking for a Marketing Manager Indirect Sales to plan and implement this important step forward.

*The successful candidate will be resourceful, imaginative, and numerate, with considerable negotiating and analytical skills, and should have:*

- *a degree*
- *experience in, and excitement about, the microcomputer industry:*
- *experience of working with dealers at a management level.*

*You will probably be a professional marketeer, with a comprehensive understanding of the relationship between marketing and the selling, support, promotion and training functions. We would not, however, rule out applicants with the right level of sales or technical experience who could demonstrate similar understanding.*

**The potential for the 480Z (and for our next generation of systems now under development) and the challenge of this 'green fields' opening make this a key appointment which will provide an opportunity second-to-none for the right applicant. Salary is unlikely to be an obstacle and we offer a particularly attractive benefits package including: car; 25 days holiday; free BUPA, life and disability insurance; pension scheme; and generous help with relocation expenses.**

***If you are interested in this vacancy please contact Polly Keane on Oxford (0865) 726136 or write for an application form, quoting reference: MMIS/CW9.***

**RESEARCH MACHINES**
MICROCOMPUTER SYSTEMS

RESEARCH MACHINES LTD Mill Street, Oxford OX2 0BW Tel (0865) 726136

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KINGDOM
COMPUTER SERVICES LIMITED

# PROFESSIONAL PROGRAMMERS

Our company is owned by computer professionals dedicated to maintaining the highest standards in Data Processing. We are currently trying to find other people like us to fill permanent, and contract, positions with our clients in the North-West.

Our most urgent requirements are for experienced programmers, analyst/programmers and software engineers to work on D.E.C. and I.C.L. equipment.

The D.E.C. clients are seeking skills in Assembler, BASIC, BASIC+ or COBOL. The I.C.L. clients require COBOL with VME experience and, ideally, IDMS and TP.

**For an initial discussion, please telephone Liz Segal, 061-928 2227 (Days), 061-928 5495 (Evenings and weekends) or, send her your C.V. to: Interoffice House, Old Market Place, Altrincham WA14 4DL**

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# U.S.A.

## Analyst/Programmers to $35K+Bonus

Exciting **permanent** career opportunities currently exist with a major U.S. bank who are at the forefront of banking systems technology. Current developments include real-time international fund transfer systems on the latest IBM hardware and software configurations.

Our client has successfully recruited over 200 UK computer professionals into the USA over the last four years. They are therefore well qualified to advise on every conceivable aspect and make all necessary arrangements to ensure that the move to the U.S.A. is completed smoothly.

**Graduates with more than 18 months IBM COBOL should have at least one of the following:**

- *CICS*
- *IMS DB/DC*
- *DL1*

These are genuine opportunities for fast career advancement on the most up-to-date techniques in an exciting and dynamic environment. Real management opportunities exist and continual in-depth training ensures a high level of skill and awareness is maintained. Fringe benefits include a generous bonus scheme and full relocation assistance for single or family status.

For further information please telephone **Keith Taylor** on (0784) 595346 (24 hour answering service) or write enclosing a full C.V. to our Reading office.

**McCOURT COUSINS LTD.**

27-29 Greyfriars Road,
Reading, Berkshire
Telephone (0734) 595346 (24 hours)

Chesham House, 150 Regent Street,
London W1R 5FA
Telephone 01-439 0288

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London Life

# ICL 2966 Operators Bristol

If you have 2 years experience with an ICL installation utilising the George 3 or VME operating systems you will be looking forward to enjoying the following benefits:

- Salary in the range of £6,000 – £7,000 p.a. including Shift Allowance (Two shifts covering 8.00 to 24.00 hours Monday – Friday)
- Subsidised house purchase facilities after 1 - 1½ years service for those over age 22
- Subsidised meals
- Non-contributory Pension Scheme
- Superb working environment with squash courts and other sports and social facilities

You must have the experience we require, be aged 18-30 and have 'O' level standard education

Genuine candidates only please phone
Steve Browness on
(0272) 279179 ext 4171

The Personnel Department,
The London Life Association,
100 Temple Street,
Bristol BS1

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DISABLED LIVING FOUNDATION

# Analyst/Programmer

An exciting and prestigious post in a national information service on disability

Applications are invited for a new post with the Disabled Living Foundation's Information Service for one year with possible extension.

The duties of the post will be concerned with the start up, development of a computer-based PDP 11/23) information and and on-line retrieval system where knowledge of databases will be relevant. A secondary task will be to extend the use of the computer in administration of the Foundation's work. The project is financed by contracted funds from the Department of Industry.

Salary: £9,000-£10,000.

Application form and further information from: The Director, Disabled Living Foundation, 346 Kensington High Street, London W14 8NS. Telephone: 01-602 2491.

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METROPOLITAN BOROUGH OF TRAFFORD
BOROUGH TREASURER'S DEPARTMENT

## COMPUTER PROJECT LEADER
## PO1 (6-10) £11,364-£12,738 p.a.

The Council is seeking a person to join its highly experienced and dedicated DP team at Sale.

The installation is a 16 megabyte IBM 3083(E) with 17.5 gigabytes of on-line storage. Conversion of the operating system from DOS/VS to MVS is currently in progress. The present climate of development is stimulating and challenging; the network comprises 120 local and remote terminals and development work on all aspects of IT is underway.

Major facilities and languages include CICS, TSO, RAMIS, UFO and COBOL. Extensive use is made of program development aids covering both batch and on-line systems for all departments of the Council. Users are encouraged to develop their own reports.

Applicants should be efficient analyst/programmers able to work without supervision to a clearly defined strategy; experience of the above languages will be an added advantage. The successful applicant will have a keen interest in systems design and user consultancy. He (or she) will also be able to motivate staff and, above all, have a dedicated and wholehearted commitment to the success of the installation.

Application form from Miss S. Dawson, Borough Treasurer's Department, P.O. Box 10, Warbrick House, Washway Road, Sale, Manchester. M33 1AT. Telephone 061-969 6161 Extension 2112. Closing date 21st September, 1983.

(5365)

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## COMPUTER OPERATIONS SUPERVISOR/OPERATOR

£5,570-£7,404

Applications are invited for the post of Supervisor/Operator to handle the Scottish component of a new United Kingdom-wide computer development for the nursing profession.

The post is located in refurbished premises in central Edinburgh. The National Board for Nursing, Midwifery and Health Visiting for Scotland will operate an on-line computer database, shared with three other National Boards and a Central Council, using an I.B.M. mainframe computer. The post requires equipment expertise with computers, terminals and telecommunications and knowledge of data handling and control. Local equipment comprises micro-computers, providing batch and on-line V.D.U. facilities.

Further particulars and application forms, to be returned by 23rd September 1983, are available from Mr Peter Taylor, National Board for Nursing, Midwifery and Health Visiting for Scotland, 22 Queen Street, Edinburgh EH2 1JX.

(5323)

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# Programmers: Help us to produce the world's best car.

As part of our commitment to produce our cars even more efficiently with the same dedication to superb standards of excellence, we are continuing the development and maintenance of our own D.P. systems.

Development areas include engineering, materials management and production, as well as financial and marketing applications.

These projects utilise the facilities of an IBM 4341 Model II with VM DOS/VSE operating system. All our new developments use IDMS database with ADS on-line. Main programming language is PL/1 using command level CICS.

The following three posts have now arisen at our Crewe production site:

### Post 1 Up to £10,000

With a background in IDMS, *but specifically with experience of ADS*, you'll be involved almost exclusively in our new developments. Experience of PL/1 and/or CICS would be preferable.

Please quote ref: Com 1.

### Posts 2 & 3 Up to £9,000

Involved in development work, you'll have 2-3 years' experience of PL/1 and/or CICS. Ideally you will also have experience of IDMS or Assembler.

Please quote ref: Com 2.

Career prospects are good and the salaries offered depend on experience. Company benefits include 33 days' holiday, a 4½ day working week, a preferential car purchase scheme, pension and sick pay schemes, sports and social clubs and a subsidised canteen. A comprehensive relocation package is offered, where appropriate.

We are pleasantly located on the outskirts of Crewe, convenient for travel from Stoke or Manchester.

Please telephone or write quoting appropriate reference, to:–

Mr. D. Roberts,
Personnel Department,
Rolls Royce Motors Limited,
Crewe CW1 3PL.
Tel: Crewe (0270) 255155 extension 3311.

Rolls-Royce Motors
A Vickers company

(5635)

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# BRISTOL for jobs

## A SENIOR COMPUTER OPERATOR

Is required to join Avon and Bristol Computer Unit, based in the Operations Division at the Council House, which initiates and looks after the operating, scheduling and throughput of batch work on a two shift system, 7.30 a.m.-11.30 p.m.

The Unit uses an IBM 434.1 under VM/OSVS1 plus two Microdata Sovereigns for Data Preparation.

At least three years experience of VM/OS/VS1, or as a Senior Operator is a requirement.

Salary: £6640-£7898 per annum + 14% Shift Allowance.

For further information and an application form, please telephone Bristol (0272) 26031, ext: 247, quoting reference CU010. Or write to the Director of Personnel, The Council House, College Green, BRISTOL BS1 5TR.

Applications are returnable by 23 September 1983

(5380)

# PUBLIC SECTOR APPOINTMENTS

## PLYMOUTH POLYTECHNIC

Research, Consultancy, Teaching in the South West
DEPARTMENT OF ELECTRICAL & ELECTRONIC ENGINEERING

### 2 SENIOR LECTURERS/ LECTURERS II

Salary: £7,215-£13,443

(level of appointment and starting salary dependent upon qualifications and experience)

### 5 SERC RESEARCH ASSISTANTS

Salary: up to £7,000

Required to join a lively multidisciplinary group embracing interests in computer hardware, software engineering, image understanding, vision and artificial intelligence forming part of a major new initiative in information engineering. The teaching and research in the Department, which is to include a new B.Eng. programme, strongly reflects these and other areas in the developing discipline of information engineering. Some of the Research and Consultancy activities will form part of a proposed industrial research institute linking the academic and industrial communities.

Applicants should have a Ph.D degree or equivalent research experience.

Lectureships in:
(i) Software Engineering
(ii) Digital Control Engineering

Research Assistantships in:
(i) VLSI Designs for Image Processing (2 posts)
(ii) Knowledge Based Software Design Tools (2 posts)
(iii) Active Tactile Sensor Arrays (1 post)

Application forms to be returned by Friday, October 14th, 1983 can be obtained with further particulars from the Personnel Officer, Plymouth Polytechnic.

(6520)

Drake Circus, Plymouth, Devon, PL4 8AA

## POLYTECHNIC OF THE SOUTH BANK

Borough Road, London SE1 0AA
COMPUTER SERVICES DEPARTMENT

### SYSTEM ANALYST

Salary up to £11,500 p.a. inclusive of London Allowance (currently under review)

A Systems Analyst is required to develop computer based systems for the Polytechnic administration. The first project will be to develop a student record information system using database methods on a VAX system.

Applicants should have at least three years' systems analysis experience, including experience of database file handling methods.

Further particulars and application form may be obtained by writing to the Staffing Office, enclosing a self-addressed envelope (measuring not less than 9" x 4").

(5488)

### LECTURER II/SENIOR LECTURER IN COMPUTING/ MATHEMATICS

Applications are invited from suitably qualified and experienced persons for the above post, which becomes vacant in January 1984.

The person appointed will be expected to make a significant contribution to the teaching of the data processing and systems analysis aspects of various computing courses offered by the Department. In addition, an ability to teach the mathematics and computing content of the various Degree and Higher Diploma courses serviced by the Department will be required.

| Salary scales: | | |
|---|---|---|
| | Lecturer II | £7,215–£11,568 |
| | Senior Lecturer | £10,683–£13,443 |

Placing on the salary scales will be according to qualifications and experience.

Application forms and further particulars may be obtained from the Deputy Registrar, to whom completed applications should be returned by 30th September 1983

BOLTON INSTITUTE OF HIGHER EDUCATION
Deane Road, BOLTON BL3 5AB
Tel: Bolton (0204) 28851

(5465)

## SOUTH GLAMORGAN COUNTY COUNCIL EDUCATION DEPARTMENT

### COMPUTER RESOURCES ASSISTANT (ADMINISTRATIVE SYSTEMS)

Scale 4/5 £6,264-£7,896 p.a.

REF A5. Required by the South Glamorgan Institute of Higher Education in the Management Information and Resources Section which deals with all administrative computing applications in the Institute. Preferably candidates should be competent COBOL programmers with systems analysis skills or those wishing to move into analysis. The successful applicant must be capable of working with the minimum of supervision and have the ability to liaise with staff at all levels. The post offers a challenging and stimulating environment developing and maintaining management information systems on a PRIME 550. A knowledge of Further Education administration would be an advantage. The person appointed will operate mainly from the Cyncoed Centre, Cardiff but will have sufficient involvement with all four centres and the Computer Unit at Llandaff, Cardiff.

Requests for Job Description and application form, accompanied by a stamped addressed envelope, to the Personnel and Management Services Officer, Floor 8, County Headquarters, Newport Road, Cardiff. CLOSING DATE 28th SEPTEMBER, 1983. Please quote job reference.

(6499)

## University of London: The London School of Economics

### Join the new SSRC Centre in Economic Computing

The SSRC Centre in Economic Computing now established at the London School of Economics and Political Science wishes to appoint four technical members of staff. These are:

1. Econometrician/Numerical Analyst
2. Database Specialist
3. Systems Analyst
4. Programmer

This is a major new initiative to provide computing support to economists in the academic community, industry and commerce. The Centre is funded initially by the Social Science Research Council with the aim of its becoming self-financing after approximately five years.

An excellent opportunity is offered to appropriate applicants to play an important part in establishing the new Centre and to influence the future development of Economic Computing. There will be a healthy balance in contact with the academic and commercial worlds. Appointments will be for up to five years in the first instance.

The Econometrician will be appointed on a scale parallel to Reader: £13,515 to £16,925 a year whilst other appointments will be on a scale parallel to University Lecturers: £7,190 to £14,125 a year. London Allowance of £1,186 a year is payable in addition on each of these scales.

Method of Application.

Application forms and further particulars are available, on receipt of a stamped addressed envelope, from the Assistant Secretary (Academic), H610, The London School of Economics, Houghton Street, London WC2A 2AE.

Closing date for applications: 10th October, 1983.

(5463)

## UNIVERSITY OF NEWCASTLE UPON TYNE

Transport Operations Research Group

### Two Posts of Research Associate: SERC special initiative in INFORMATION TECHNOLOGY IN TRANSPORT

Applications are invited for two posts of Research Associate for fixed terms of 18 months from mid-November 1983. Both posts are funded by SERC as part of their special initiative in information technology in transport.

Project A is designed to explore, in consultation with GEC Traffic Automation Ltd., the technical feasibility of developing an automatic vehicle identification system at the roadside for heavy lorries and of applying this technology to an overall road-use pricing system for goods movement in a large conurbation. With the cooperation of the GLC, London will be used as a case study.

Project B will be conducted with the cooperation of London Transport and will evaluate the real-time dot matrix displays which have been installed at a number of underground stations. The impact of the system on passengers' perceptions of waiting time and on route choice will be assessed in order to explore the prospects for more widespread use of such systems.

Applicants should have a relevant higher degree and, particularly for project B, appropriate industrial or research experience.

Salary will be according to age and experience on the Range 1A scale, £7,190 to £11,615 per annum; with a maximum of £8,075 per annum for Project A and £7,630 per annum for Project B.

Further particulars of the posts can be obtained from U. T. Silcock, Division of Transport Engineering, Department of Civil Engineering, The University, Newcastle upon Tyne NE1 7RU, to whom applications should be sent by 4th October 1983 citing three referees and enclosing a curriculum vitae. Applicants should state interest in post A or post B.

(5540)

## LONDON SCHOOL OF ECONOMICS COMPUTER SERVICE

### RSTS Support Programmer

The School has several PDP 11 computers which are used for a variety of word processing and administrative tasks, and applications are invited from experienced programmers to become a member of the team supporting the computers and developing applications in areas such as timetabling, information retrieval and student records.

Duties will comprise: Supporting RSTS at the system level, including troubleshooting, system organisation, writing operational procedures, handling upgrades and installations; monitoring the Word-11 package at the computer level, together with some user contact; arranging file transfers between the RSTS machines and with a variety of other computers, from micros to mainframes; writing application programs in BASIC PLUS, COBOL and CUPID to agreed specifications; designing and using database/information retrieval systems.

Applicants will be expected to have a good degree in a computer-based discipline, and preferably at least two years' relevant experience. Salary, according to age and experience, will be in the range £7,400-£11,100.

Application forms, returnable by September 29, 1983, should be obtained from the Personnel Department, LSE, Houghton Street, London WC2A 2AE, telephone 01-405 7686.

(5516)

## MID-GLAMORGAN COUNTY COUNCIL

COUNTY CLERK AND CO-ORDINATOR'S DEPARTMENT

### INDIS

TREFOREST ESTATE NEAR PONTYPRIDD

### PROGRAMMER/ ANALYST

Salary £7,191-£7,896 per annum

Qualification requirements: Graduate or other appropriate professional computer qualification.

The successful applicant will have two years' experience of programming COBOL preferably with RANDECOBOL on ICL ME29 working under TME. Some experience of network communication, viewdata systems and DRS would be an advantage.

The successful applicant will work on a fast developing industrial information system, correcting, modifying and maintaining existing software. Also developing and writing programmes for new application, with particular emphasis on peripheral patching and a private viewdata system. The duties will entail working as a specialist within a team of non-computer personnel and liaising with programmer/analysts in the County Treasurer's Department. A certain amount of self-motivation will be required.

NATIONAL CONDITIONS OF SERVICE

Application forms, to be returned by September 30, 1983, are available from the County Personnel Officer, Mid-Glamorgan County Council, Cathays Park, Cardiff, or telephone Cardiff (0222) 28033, ext. 249.

CANVASSING WILL DISQUALIFY

(5481)

## UNIVERSITY OF LIVERPOOL

Computer Laboratory

### DEPUTY DIRECTOR

Applications are sought for the above post. The person appointed will be responsible for the day-to-day running of the computing service and assisting the director in the planning and development of computing services for the university, particularly the academic services. The successful candidate will be expected to deputise for the director when necessary and so a wide knowledge of, and involvement in, all aspects of university computing services will be necessary. Candidates should be graduates with considerable experience in computing and computing service provision, particularly university services. A relevant postgraduate qualification would be an advantage, but above all, proven ability to organise and supervise the work of other staff is essential for this post.

Initial salary will be within the range £13,815 to £14,485 per annum on scale rising to £16,925 per annum with the possibility of subsequent promotion.

Applications, including the names of three referees, should be sent by October 14, 1983, to The Registrar, The University, P.O. Box 147, Liverpool L69 3BX, from whom further particulars can be obtained. Quote Ref: RV/140.

(5521)

## THE UNIVERSITY OF PAPUA NEW GUINEA (Port Moresby)

VACANCY

### PROGRAMMER

Wanted. Salary package – £14,000 equivalent p.a. plus free housing.

Details: Assistant Secretary (Staffing) Box 320, University P.O. PAPUA, NEW GUINEA

(5446)

### BOX NUMBERS

Box number replies should be addressed to:

Box Number ..........

c/o Computer Weekly
Quadrant House
The Quadrant
Sutton, Surrey SM2 5AS

## Lancashire County Council

An Equal Opportunities employer

COUNTY TREASURER'S DEPARTMENT

### SENIOR SYSTEMS PROGRAMMER (MICRO)

Salary within the Current range SO1/PO1 (1-7) – £9,080-£11,[illegible]

This is a new post and is one of three senior systems programming posts within the Systems Support Section, which is headed by a Principal Systems Programmer. There are also separate Programming and System Analyst Sections. The duties will involve working closely with the Principal Systems Programmer and other senior members of staff in the identification and exploitation of modern technology to the benefit of the County Council. The Authority has a wide range of equipment including terminals, word processors etc and a strategy to link this equipment is being developed.

The computer installation, which will shortly be enhanced, presently consists of an ICL 2976 with 8 mb store, considerable fixed and exchangeable disc storage and communications facilities providing an IJE, MAC and TP service operating under VME(B). This machine also provides extensive facilities for [illegible] District Councils and a Development Corporation

The location is in Preston which has excellent road and rail links as well as being only one hour's drive from the Lake District and other areas of scenic and leisure attractions. There is available a scheme for the reimbursement of relocation expenses.

Applicants should have more than two years of practical experience in software support on modern technology micro equipment and be able to communicate with technical and user staff at all levels. Application forms are available from The County Treasurer, PO Box 100, County Hall, Preston, or by telephoning Anne Booth on Preston 264776

Closing date: Friday, 30th September, 1983

## UNIVERSITY COLLEGE LONDON

Computer Centre

### PROGRAMMERS

We are looking for a number of PROGRAMMERS to join [illegible] writing software for a service based on linked GEC 4190 computers providing predominantly keyboard access for staff and [illegible]. The Centre is enhancing both the local service and its [illegible] networking facilities and is seeking programmers with an interest in operating systems, telecommunications, computer [illegible] graphics or scientific applications software. A relevant degree or equivalent professional qualification is required. Salaries are paid on academic related scales, up to £12,[illegible] (including London Allowance). The initial salary will depend on qualifications and experience.

Applications (no special forms) including full c.v. and the names of two referees should be sent to: Computer Manager, University College London, Gower Street, London WC1E 6BT by [illegible] [illegible] 1983. Further information can be obtained from the above address or by telephoning 01-388 6721

## POLYTECHNIC OF THE SOUTH BANK

Borough Road, London SE1 0AA
COMPUTER SERVICES DEPARTMENT

### Application Programmer (2 posts)

Salary up to £8,258 per annum inclusive of London Allowance [illegible]

Vacancies have arisen within the Computer Services Department for Programmers in the User Support team to install software packages, [illegible] new software, amend existing software and contribute to the programming advisory service offered to students and staff.

The persons appointed will be of graduate level with a minimum of [illegible] years' programming experience in at least two languages. Experience of [illegible] 10 or VAX Systems would be an advantage.

Application forms and further particulars of these posts are available from the Staffing Union, Tel 01-928 8989, Ext. 2355.

Closing date for receipt of completed application forms will be [illegible] 1983.

## UMIST

DEPARTMENT OF COMPUTATION

### MICROELECTRONIC SYSTEMS ENGINEERING

Applications are invited for the post of Lecturer in Computation to join the team developing a new four-year B.Sc., O.Eng. course "Microelectronic Systems Engineering" in collaboration with industry and the Department of Electrical Engineering and Electronics. The successful candidate will have an opportunity to assist in the development of the curriculum and its associated teaching laboratories based on new microprocessor based equipment and will be expected to carry out research.

Applicants must have appropriate research or industrial experience in one or more of the following areas: Artificial Intelligence, IKBS, Speech Processing, Image Processing, Multi-Processor Computer Systems, CAD for VLSI, Display Systems.

Salary will be according to age and experience on the scale £7,190-£14,125 p.a.

Requests for application forms and further particulars, quoting reference COM/178/CW, should be sent to the Registrar, Room [illegible], UMIST, PO Box 88, Manchester M60 1QD. The closing date is October 3, 1983.

## UNIVERSITY OF BRADFORD

### COMPUTER OFFICER POSTS

1. ADMINISTRATIVE DATA PROCESSING

To join a small development team [illegible] on Finance, Payroll and Library [illegible] tions, with current development [illegible] a more extensive on-line [illegible] ICL 2904/30 with the usual [illegible] pherals is in use, with [illegible] for communications. Familiarity with COBOL, MTS and TABS [illegible] knowledge of public sector [illegible] procedures would be advantageous.

2. ACADEMIC AREA OF COMPUTING

This area makes extensive use of a number of UNIX based DEC [illegible] duties consist of maintenance [illegible] ware for these systems and [illegible] gramming support to members of staff including research personnel [illegible] variety of both large and small [illegible] Knowledge of relevant systems [illegible] required and experience with [illegible] systems is desirable.

Both posts are offered as permanent appointments to qualified and [illegible] staff on the 1A Scale £7,190-£11,[illegible] Application forms from the [illegible] Office, University of Bradford [illegible] Tel: 0274-733466, Ext. 8[illegible]

## UNIVERSITY OF EDINBURGH

Edinburgh Regional Computing Centre

### SENIOR COMPUTING OFFICER COMMUNICATIONS SOFTWARE

A Graduate with several years' experience in software design and implementation, with preferably some experience of dealing with hardware, is required to work on the development of the University Data Network. The Network currently comprises of a large X25 network based on 3 GEC packet switches and a Cambridge Ring with over a thousand terminals and 14 hosts. Most of the development work in the next three years will, however, be concentrated on the integration of an Ethernet into the Network which is due to be installed in the next few months.

The appointment will be a permanent post on the Senior Computing Officer Scale of £10,710 to £14,125 plus superannuation.

For application or further particulars please apply to the Administration Officer, ERCC, James Clerk Maxwell Building, Mayfield Road, Edinburgh EH9 3JZ or telephone 031-667 1081 Extension 2628

(5321)

## The IBM SYSTEM 34/36/38 Recruitment Specialists

### Permanent vacancies for programmers, analyst programmers and above

March Computer Recruitment is a specialist consultancy which is demonstrating its recruitment expertise with its growth and operating success.

We are inviting you to share our specialist knowledge in the IBM Systems 34/36/38 field with access to a personal service and:

- A real understanding of your technical and personnel needs.
- An established GSD candidate bank, UK wide.
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- Sound advertising and management selection advice.
- A strict code of practice including absolute confidentiality for prospective applicants.
- A sensible and competitive fees policy.

'Phone Richard Milsum, for an informal and confidential discussion of your requirements on: 01-354 1055, during office hours or on 01-958 2553 evenings and weekends. Alternatively please send full details to me at:

(5428)

MARCH COMPUTER RECRUITMENT
1 NOEL ROAD, LONDON N1 8HQ
01-354 1055

## Project Leader – Global Data Network

based Hong Kong

c.£20K p.a. tax paid + substantial fringe benefits

The Hongkong Bank Group, as well as being one of the world's leading financial organisations, is an industry leader in EDP applications and EFT networks.

Due to the expansion of its corporate and consumer banking services, a Project Leader is required to join the Technical Services Division in the Head Office in Hong Kong.

You will have responsibility for the development and implementation of a packet switched network and the interface to terminal systems in the Group's offices throughout the world. This will entail extensive travel as the project progresses.

It is most unlikely that candidates less than 30 will have the experience of international communication systems and the disciplines of computer system development that are essential for this position.

Conditions of service are excellent. In addition to the tax paid salary indicated, the post carries attractive benefits including free fully furnished accommodation, a housing loan in your home country, six weeks' annual leave with free air travel, children's education allowance and holiday passages.

Please ring or write for an application form by Monday, 26th September 1983, to: A.M. Child, International Recruitment Controller, The Hongkong Bank Group, 99 Bishopsgate, London EC2P 2LA. Tel: 01-638 2366, ext. 2923.

HongkongBank
The Hongkong and Shanghai Banking Corporation

(5518)

# PUBLIC SECTOR APPOINTMENTS

## university college of swansea

Department of Electrical and Electronic Engineering

Applications are invited for the vacancy of

### Lecturer

in the Department of Electrical and Electronic Engineering.

Applicants should preferably have research interests in Computer aided Design of devices, circuits or systems.

The appointment, which will commence from the soonest date that can be arranged, will be on the scale £7190-£14125 per annum plus USS/USSPS benefits

Further particulars and application forms (2 copies) may be obtained from the Personnel Office, University College of Swansea, Singleton Park, Swansea SA2 8PP, to which office they should be returned by Friday, October 7, 1983

(5533)

## National Institute of Agricultural Botany

A person is required by the Institute's Seed Production Branch to assist a team of technical, clerical and data processing staff engaged in creating, testing and implementing a new on-line computer system for handling information from cereal seed certification schemes.

Candidates should possess a minimum of five GCE 'O' levels, grades A-C including English and Mathematics. The successful applicant is likely to have had experience using a terminal or word processor in an office or laboratory environment. The successful applicant will probably be over 21.

In the first instance the post will be based on a two-year fixed term contract. Salary scale £4,381 at age 21 or over rising to £5,708 p.a. 22-day annual leave. Non-contributory superannuation.

Application form and further details from Executive Officer (Personnel), NIAB, Huntingdon Road, Cambridge CB3 0LE. Telephone: Cambridge 276381, Ext. 224. Please quote reference SV/736/CW. Closing date 30 September, 1983.

(5495)

## Imperial College of Science and Technology

SERC/Rolls-Royce Teaching Company

### SENIOR ASSISTANT

Required for company established in association with Imperial College to develop a CAD/CAM system for the design and manufacture of turbine components for a new Rolls-Royce Gas Turbine. Applicants should have a PhD degree in Mechanical Engineering together with extensive experience in developing CAD/CAM software and writing CAD/CAM software on mini and microcomputers. Applicants will also be required to assist academics with teaching duties including the supervision of postgraduate research. Salary will be in range £12,800-£13,731 per annum.

Applications to Dr C. Besant, Department of Mechanical Engineering, Imperial College, London SW7 by September 30, 1983.

(5538)

## BEDFORD COLLEGE OF HIGHER EDUCATION

### SENIOR LECTURER IN COMPUTER STUDIES

To take a major role in the development of this changing and growing area. Applicants should have industrial/commercial and teaching experience. Expertise in several of the following areas is advantageous:

Computer Systems architecture, microchip technology, inter-facing of micro processors, Fortran, Pascal, machine language programming.

Application form from:
The Director, B.C.H.E., Mander
Cauldwell Street, Bedford MK42 9AH
Telephone: 0234 45151

(5460)

## UNIVERSITY OF LIVERPOOL

Computer Laboratory

### SECTION MANAGER

Applications are sought for a Section Manager to take responsibility for the hardware and communications work of the Computer Laboratory and its service. The person appointed will be in day-to-day charge of the technical staff of the Laboratory and the professional staff of the Microprocessor Laboratory. The person appointed should be a graduate and must have experience in computing hardware design and construction. A knowledge of hardware aspects computing communications is also important. A relevant postgraduate qualification would be an advantage as would previous experience in project management.

Initial salary will be within the range £10,710 to £14,125 per annum with the possibility of subsequent promotion.

Applications, including the names of three referees, should be sent by October 14, 1983, to The Registrar, The University, P.O. Box 147, Liverpool L69 3BX, from whom further particulars can be obtained. Quote Ref: RV/141.

(5522)

## NORTH EAST SURREY COLLEGE OF TECHNOLOGY

### COMPUTER ASSISTANT

SALARY SCALE £5229-£6405

The College Computing Unit needs a person with elementary knowledge and experience of computer programming.

Duties are varied, but primarily involve assisting the Systems Programmer in writing programs on a variety of micro-computers and a VAX11 750 mini computer. The successful applicant will be expected to assist academic staff tutoring students using the equipment, and to participate in the day-to-day running of the college computer system.

Normal working hours are 36 per week. Some evening work during term time.

Please send SAE for application form to Personnel Section, NESCOT, Reigate Road, EWELL/EPSOM, Surrey KT17 3DS.

(5549)

### COMPUTER PROGRAMMER

Further details from the Personnel Office, NIAB, Huntingdon Road, Cambridge CB3 0LE. Tel Cambridge (0223) 276381 Ext 224 quoting SV 698 W

### CHIEF OPERATOR

GRADE P2A

£13,060-£14,322

Extensive IBM operations and management experience is required for this post.

Application forms and job description from:

Beryl Derrington
LOLA
Tower Point North
Sydney Road
Enfield EN2 6UE
Tel: 01-366 6611 ext. 276

(5543)

### BOX NUMBERS

Box number replies should be addressed to:

Box Number ..........

c/o Computer Weekly
Quadrant House, The Quadrant
Sutton, Surrey SM2 5AS



## SALES BIT

Quality of Management – 65

# Taking on new managers is a risky business

ON the day I returned from holiday I received telephone calls from two managing directors, both asking me to recruit new national sales managers for their organisations.

One of the first things to consider is whether it is necessary to go outside the company to find the best available person. You don't know people until you live with them, and no matter how well qualified or highly recommended a newcomer might be he is nonetheless a stranger whose capabilities are unproven and who may not fit the company style.

Most managers look good on paper, and even if they haven't hyped up their own curriculum vitae, the chances of any recruitment agency underselling their career history are a bit remote. Newcomers involve a considerable risk because they consist entirely of unknown factors.

Existing employees are a different proposition because one is generally aware of their capabilities, warts and all. Obviously one would not need to look outside if the complete talent and experience required already resided within the company.

But the reflex action of many managing directors on the departure or demise of a subordinate manager is to try to replace him with the perfect being they would now like to have in order to compensate for the inadequacies of the previous incumbent.

But what about those who have already enjoyed success on the company's behalf and now aspire to this vacant seat? If they are not considered or simply passed over they will assume that their career potential with the company is at an end, which probably means that even if they don't go rushing off to people like me for consultation they will be susceptible to every relevant press advertisement or direct approach on behalf of competitors. A situation to be avoided if possible.

The departure of a manager can be a good time for taking a calculated risk on an internal candidate who has yet to prove himself in some aspects of the vacated management slot. Often this may mean giving a salesman who has never been a manager of men the chance to prove himself.

In this case one has to be fairly confident that the person concerned has the right attitudes and human characteristics to handle the special demands that management implies.

One short cut I would always recommend is vocational testing, which is a reliable guide to the strengths and weaknesses of the individual relative to various job functions.

I recommend the Vocational Guidance Association of Upper Harley Street, London, (tel: 01-935 8017) which offers a comprehensive evaluation service at a cost of £103. It does not ask what your present job is, but tests you and then counsels you in the context of the types of occupations most suited to your talents – priceless information in my book.

The benefits of seriously considering internal candidates are many. It is a boost to the morale of all concerned to know that they are being considered for promotion, even if they don't actually get the job. More companies lose their best salesman in such circumstances than in any other.

Suddenly to have a new boss from a foreign company without as much as a consultation can be very damaging to the ego.

Bringing in a new employee from outside the company is always a risk, and so is promoting someone from inside, but the risks are different. It is up to the senior executive to consider which are the more acceptable.

Anyway, I duly met with the two clients. The first told me that he had spent a considerable time evaluating not only potential contenders from within but also the job itself. Was the task a tenable one? Had circumstances altered since the previous incumbent was appointed? The market and their product had certainly changed, so why not also some aspects at least of the job in question?

He had gone to great pains to consider existing staff for this job opportunity and concluded that, while there were undoubtedly those with the potential, none had been given sufficient time to complete the tasks already set them. In other words, the time wasn't right.

So he had to carry out not only his own job but also act as stand-in for the departed sales manager. Yet, he thought it a labour well worth the investment in order to have the best chance of getting the right person.

I could only admire his thoroughness and dedication. It is nice to know one is presenting candidates to such a thoughtful and intelligent employer.

My visit to the other company was not so rewarding. Candidates from within the department had been considered, and the available candidates were either unsuitable or unready.

The possibility could not be discounted that head office might step in with their own man.

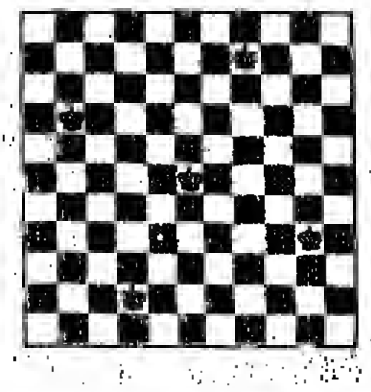
I eventually found myself turning down the business, at least for the present. It wasn't simply a matter of my responsibility to the candidate; although it is important for any recruitment specialist to realise that if he is doing his job properly he probably knows more about the job situation than the applicant and so has the responsibility of protecting him from any risk that might be involved.

It was the sure knowledge that if there is any uncertainty about the nature, let alone existence, of a job, then it is wisest to suspend any recruitment until the job is totally stable in terms of its function, viability and existence. It is difficult enough for a new appointment to succeed without the additional burden of uncertainty and insecurity.

And failure at the sales management level can easily bring about the demise of an entire organisation.

*Alan Williams*

■ Alan Williams' book, *All About Selling*, published by McGraw Hill, £8.90, is now available from Sales and Marketing Services, 29 Oxford Street, London W1.

## PUZZLE ANSWER

THE basic configuration for the Queen is: